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USSR Report

TRANSPORTATION

No. 25

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AIR

BRIEFS

YAK-42 IN UZBEKISTAN--The new YaK-42 passenger turbojet has made its first appearance in the skies of Uzbekistan. A crew under the command of O. Smirnov and specialists from the State Scientific Research Institute of Civil Aviation are conducting tests on its flight performance under the conditions of the Central Asian climate. During August tests will be made on the run Moscow--Tashkent--Ashkhabad--Tashkent--Moscow. The 120-seat high-speed (up to 850 km per hour) aircraft will replace the AN-24 and YaK-40 on the local Aeroflot routes. During the 11th Five-Year Plan, the YaK-42 will begin regular service from Tashkent to the oblast centers of the republic. Sh. Zaynutdinov. [Text] [Tashkent PRAVDA VOSTOKA in Russian 16 Aug 80 p 2] 10272

NEW NUKUS SERVICE--The first stage of a new air terminal complex was opened in a ceremony in the capital of Karakalpakia. On board the Tu-154 making its first flight from Tashkent to Nukus were specialists from the various Aeroflot services headed by B. Grubiy. The new airport in Nukus is being built under plans of the Uzbek Scientific Research and Design Institute for Urban Construction of Uzgiproavtodor [Uzbek State Institute for the Designing of Motor Transport and Highways]. Scores of construction subunits from Karakalpakia are involved in its building. The airport navigation equipment permits the landing of large passenger liners according the the first and second ICAO categories. ...The trip was coming to its end. Our Tu-154 made its approach and landed. At the ramp a meeting was held and this was opened by Ye. Aytmuratov, chairman of the Karakalpak ASSR Council of Ministers. K. Kamalov, first secretary of the Karakalpakskaya Party Obkom, and G. Rafikov, chief of the Uzbek Civil Aviation Administration expressed gratitude to the construction workers who completed the first stage of the airport complex with an evaluation of "excellent." Sh. Zaynutdinov. Tashkent. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 12 Aug 80 p 1] 10272

ENGINE RELIABILITY--Highly productive equipment is being installed at the Rybinsk Engine Building Production Association. Due to the introduction of progressive equipment and production methods and advanced labor methods, the operational reliability indicators for the engines of the IL-62M aircraft will be increased by 10 percent in comparison with 1979. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Sep 80 p 2] 10272

MOTOR VEHICLE

MINISTER CITES PROBLEMS, GOALS FOR RSFSR ROADS

Moscow AVTOMOBIL'NYYE DOROGI in Russian No 7, 1980 pp 1-4

[Article by RSFSR Minister of Roads A. A. Nikolayev: "At the Level of Contemporary Requirements"]

[Excerpt] Growth in scales of production and mobility of the population, specialization and division of labor, remoteness of raw material sources, and a number of other factors place ever greater demands on transportation. Overall, the effectiveness of social production to a great degree depends on transportation's uninterrupted and economic operation. The role of vehicle transportation in agriculture and in newly-assimilated regions is especially great and absolutely irreplaceable.

Practice shows that introduction of highly-intensive industrial methods into agriculture in essence is impossible without diligent and uninterrupted vehicle transportation connected via reliable roads to all components of a single agricultural complex. This problem cannot be solved simply by increasing the number of vehicles. This approach is extensive, economically unjustified, and too costly to the state, kolkhozes, and sovkhozes.

As special research demonstrated, transportation delays in regions lacking roads reach 40-47 percent of the production cost of the agricultural product, and often the production cost exceeds the income from product sales. Farms suffer losses from a drop in quality and product spoilage due to late shipment. Often, mineral fertilizers cannot be delivered to the field on time due to the absence of roads.

It can be considered axiomatic that there is no such thing as a blossoming, profitable farm where roads are lacking. And, on the contrary, numerous examples demonstrate that construction of a good road to a remote area means that kolkhoz or sovkhoz affairs take a turn for the better: cadres are reinforced, the youth drain is reduced, farming and animal husbandry productiveness increases, the rural workers' labor productivity improves, and farm profitability overall grows.

A great deal of know-how in construction of local roads in coordination with kolkhozes, sovkhozes, enterprises, and financial organizations has been accumulated in the RSFSR and in other union republics. During the last two five-year plans, the length of hard surface roads in the Russian Federation rose 224,000 kilometers, i.e., by a factor of more than 4, in the main due to this source. Hard surface roads have been built to [illegible] of the 23,300 kolkhozes and sovkhozes in Russia as of 1 January [illegible] and to 1,500 of the 1,803 rural rayon centers. More than 500 kilometers of permanent bridge surface have been built. However, 200,000 kilometers of common-user dirt road remain in the RSFSR and these roads are difficult to get through during the wet season, i.e., during planting and harvest.

The CPSU Central Committee is constantly [illegible] the condition [illegible] country's roads. The Soviet people, all the country's communists, are well aware of comrade Leonid Il'ich Brezhnev's fundamental directions concerning the role of good roads, concerning their significance for development of an [illegible]ture in a society of developed socialism, for creation of a continuous foodstuffs complex, for the guarantee of a merging of the standards of living of the urban and rural populations. At comrade L. I. Brezhnev's personal initiative, in April of this year the CPSU Central Committee and USSR Council of Ministers passed a decree entitled "On Measures To Improve The Construction, Repair, And Maintenance Of The Country's Roads."

Passage of this decree is a brilliant new manifestation of the concern of the CPSU Central Committee and USSR Council of Ministers for development of the country's road network as an immutable condition for the Soviet society's successful economic and social development.

In accordance with this decree, creation of a stable network of main highways with improved surfaces will be completed by 1990, which will insure reliable vehicle communications among the country's large economic regions and population centers. Also, construction of local roads linking rural areas with oblast (kray, ASSR) centers and kolkhoz/sovkhoz central farmsteads with rayon centers will in the main be completed.

Accomplishment of these tasks in the RSFSR will require a guarantee of construction and reconstruction of many roads in the period prior to 1990.

More than 300 kilometers of the Moscow-Khar'kov-Simferopol' road must be built and rebuilt, including more than 200 kilometers of the MKAD [Moscow Ring Road]-Serpukhov-Tula-Orel Section. Work is underway here at high rates using DS-100 and DS-110 road construction complexes. Construction also will begin on the prime section of the Moscow-Voronezh highway (MKAD up to Kashira), where the intent is to build more than 100 kilometers of new highway in 1981-1985.

Work will continue on the Moscow-Yaroslavl' and Moscow-Riga highways, as well as on a number of sections of the Transsiberian Highway.

Russia's road builders are faced with a great deal of local road construction. As of the beginning of 1980, only 31 of the 71 oblasts (krays, ASSR) in the

RSFSR had completed construction of roads linking rural areas with oblast (kray, ASSR) centers. This includes Voronezhskaya, Gor'kovskaya, Belgorodskaya, Bryanskaya, Novgorodskaya, Kemerovskaya, Kurskaya, Kuybyshevskaya, Vladimirskaya, Ivanovskaya, Leningradskaya, Kaluzhskaya, Moskovskaya, and Smolenskaya oblasts, the Chuvashskaya and Kabardino-Balkarskaya ASSR, and others. Road organizations in the Mariyskaya, Mordovskaya, and Bashkirskaya ASSR and Orenburgskaya, Rostovskaya, Chelyabinskaya, Astrakhanskaya, and Kalininskaya oblasts are close to completion of this task.

The full capability to tie rayon centers to main highways during the 11th Five-Year Plan exists in the Federation's administrative territories enumerated above.

More complex tasks face party, Soviet, and economic organs and road organizations in Arkhangel'skaya, Vologodskaya, Kirovskaya, Irkutskaya, Kurganskaya, Novosibirskaya, and Tomskaya oblasts and the Kalmytskaya and Komi ASSR, as well as several other territories, where completion of construction of roads to all rayon centers requires building hundreds, and sometimes thousands, of kilometers of new roads. Road builders are banking on a great deal of help in this endeavor from local Soviet organs, just as envisioned by the CPSU Central Committee and USSR Council of Ministers decree cited above.

Also, the linkage of all kolkhoz and sovkhoz central farmsteads to rayon centers, primarily in the Non-Chernozem Zone of the RSFSR, must be completed by 1990.

At the beginning of the current year only 11 oblasts (krays, ASSR) in the Russian Federation had completed the linkage of central farmsteads. This is close to completion in nine oblasts (krays, ASSR). However, a still significant number of local roads to provide stable year-round ties among kolkhoz/sovkhoz centers with a stable road network within the Russian Federation must be built during the 11th and 12th five-year plans.

The ministry is counting on great assistance from Soviet and party organs locally to solve this problem. Practice showed that, where Soviet and party organs actively aid road organizations, road construction, repair, and maintenance problems successfully are solved, the road organizations' production and domestic base is developed well, and stable cadres of engineering and technical workers and qualified workers--enthusiasts and real professionals--are created.

Soviet and party organs in Saratovskaya, Sverdlovskaya, Smolenskaya, Rostovskaya, Novgorodskaya, and a number of other oblasts set the example for such an approach to solution of road-building problems. As a rule, road construction rates are higher in these oblasts. For example, almost 2,000 kilometers of new roads with improved types of surfaces were built in Saratovskaya Oblast during the 10th Five-Year Plan.

Of great significance are the directives of the CPSU Central Committee and of the USSR Council of Ministers that union republic party Central Committees, union and autonomous republic councils of ministers, and the ispolkoms of kray and oblast Soviet of Workers'

Deputies must consider their most important task to be achieving measures to mobilize inner reserves to accelerate construction and turnover of roads (through concentration of extant material and financial resources, improvement in technology and production organization).
The CPSU Central Committee and USSR Council of Ministers placed special attention on improving the quality of road construction, [illegible] repair and maintenance, developing a technical production base (including housing) for road organizations, strengthening them with worker and specialist cadres, broad introduction of modern technical procedures and methods of labor organization, and disseminating the brigade contract and other progressive forms of labor organization.

A significant increase in road construction rates with a simultaneous increase in the durability of roads being built and improving the maintenance of extant highways requires that the workers in the republic's road construction management accomplish new forms of labor organization in road construction, further develop the road industry, and instill high discipline and stability as they accomplish their assigned tasks. A high level of road construction and maintenance quality must be guaranteed based on strict adherence to technological discipline, broad introduction of modern technological procedures and labor organization methods, and further dissemination of the brigade contract and other forms of labor organization.

Problems of road construction planning must be placed on a footing equal to the tasks facing the sector. The CPSU Central Committee and USSR Council of Ministers Decree "On Improvement In Planning And Intensification Of The Effect Of The Economic Mechanism To Increase Production Efficiency And Work Quality" provides a great deal of assistance here. Strict adherence to all elements of this Decree will aid in solving the problem of evaluating the activities of organizations and enterprises based on the end result--timely turnover of roads and bridges built at a high engineering level within strict suspenses with minimal expenditure of material and financial resources.

The involvement of so-called "big industry" in solution of the road problem is one special feature of this Decree. In accordance with measures affirmed by the CPSU Central Committee and USSR Council of Ministers, 15 union ministries, plus USSR Gosplan, USSR Gossnab, USSR Gosstroy, GKNT [State Committee for Science and Technology], and the AUCCTU have been tasked to aid in successful solution of the road-building problem.

Mintransstroy [Ministry of Transport Construction], parent organization of Soyuzdornii [State All-Union Scientific Research Institute of Roads and Highways] and Soyuzdorproyekt [State Institute for the Planning and Surveying of Highways of the State Industrial Committee for Transportation Construction], which in 1970 developed the General Outline For Development of the National- and Republic-Level Road Network, has been tasked to refine that outline and submit it for approval to USSR Gosplan in 1981. Approval of this General Outline will make it possible to work up five-year and annual new road construction plans on a scientific basis stemming from the national economy's interests. Here, priority must be given to highways which insure the transfer of present-day volumes of irrational, short-haul cargo from railroads to vehicle transport, as well as to highway sections near large cities, as a rule by by-passing the latter, and to international highways.

Economic methods of constructing high-quality and lasting roads made of cement and soil mixtures and thin concretes, proven through many years of practice, must be broadly disseminated. This dissemination unjustifiably was delayed by a shortage of road cements and the requisite means for integrated mechanization of operations.

Several other problems found solution in the CPSU Central Committee and USSR Council of Ministers Decree mentioned above.

Construction, reconstruction, repairs, and maintenance of the common-user roads in the Russian Federation in 1981-1985 require a significant amount of gravel, including high-impact gravel, without which high-quality road surface upper layers cannot be guaranteed. There is an annual shortage of 5-6 million cubic meters, taking internal production of such gravel at the ministry's enterprises into account. It should be noted that mainly this shortage impacts upon the Federation's Non-Chernozem Zone, which as a rule lacks its own sources of high-impact stone.

Enterprises in the USSR Ministry of the Construction Materials Industry must become involved for road-building organizations to be fully supplied high-impact gravel. The CPSU Central Committee and USSR Council of Ministers Decree also envisions this. This ministry, along with the union republic councils of ministers, must work up and accomplish the requisite measures directed towards a growth in the volumes of gravel output, which satisfies road construction requirements.

The Ministry of Construction, Road, and Municipal Machine Building [Minstroydormash] has been assigned serious tasks. This is because the level of mechanization of several road-construction and repair operations remains low. The products list and unit power of road machinery do not satisfy road builders. Road organizations in the main receive low-power machinery that is barely suitable for construction of modern roads.

The situation involving mechanization of road repair and maintenance operations is especially unfavorable. Practically speaking, Minstroydormash does not produce machinery for these purposes. For example, the RSFSR Minavtodor [Ministry of Roads] was forced to organize production of some machinery in its own enterprises. The road-building ministries in other union republics also are doing the same thing. However, the capacity of these enterprises is small and technological capabilities restricted. They cannot satisfy the growing needs of the road management, either qualitatively or quantitatively.

RSFSR Minavtodor prepared a recommendation on creation and production of a series of road construction and repair machinery at Minstroydormash enterprises until 1990 for submission to USSR Gosplan and USSR Gosstroy. This includes machinery for regeneration of the asphalt concrete surfaces on extant roads, wide-cut soil mixers and asphalt spreaders, and others. Realization of these proposals will allow workers not only to increase road construction rates, but also insure a high level of road construction, repairs, and maintenance quality and free a large number of workers, who are involved in hard labor.

Improvement in such road accessories as modern reflective signs and markers in the form of nitroepoxy enamels and thermoplastics to raise the level of traffic safety is mandatory. Minkhimprom [Ministry of the Chemical Industry] is faced with the task of producing reflective tape of significantly improved quality. As opposed to the smooth tape used overseas, the domestic tape (produced in Rostov) has a coarse surface and unsatisfactory reflective qualities. Signs made with this tape practically speaking are unreadable at the range the standard requires during the hours of darkness. Besides, road organizations have an insufficient supply of this tape: RSFSR road organizations receive 340,000-360,000 of the 600,000 square meters of this tape required annually. The other union republics also receive about the same percentage of their requirement.

The problem of supplying nitroepoxy enamel to road organizations for marking highways is important. This enamel is produced in extremely limited quantities. The ministry supplies just 16-18 percent of the requirement. Just about the same is true for termoplastic--a more modern road-marking material.

Minkhimprom's accomplishment in 1981-1985 of measures to increase production of these and several other chemical road materials (polyethelyne for road accessories, reflective fabric for special clothing) will aid in improving road accessories and traffic safety.

Provision of modern instruments for direct evaluation of road construction quality and of the operational indicators of extant surfaces for road construction and maintenance is a serious problem. The RSFSR Minavtodor assimilated production of 40 types of laboratory equipment at its own enterprises. However, modern instruments require computer and measurement equipment, requiring the participation of the Ministry of Instrument Making, Automation Equipment, and Control Systems in their creation and manufacture. This problem cannot be solved without such participation.

On the agenda is the problem of supplying instruments and equipment to road organizations to allow them to obtain expeditious and accurate data directly during the measurement process. Problems of organizing manufacture of laboratories for direct monitoring of such road clothing and surface qualities as durability, smoothness, and degree of adherence with the protective coating must be solved. Manufacture of radioisotope densimeters and moisture gauges, instruments to automatically count traffic, plotters for design organizations, and so on must be increased.

The entire range of problems forming the concept of "road repair and maintenance" regularly will be examined by a coordination council created for this purpose by the RSFSR Minavtodor. This will facilitate development of unique and rational solutions for all the road organizations of all union republics, without a doubt taking their specifics into consideration.

The CPSU Central Committee and USSR Council of Ministers decree also envisaged that Mintransstroy, with the participation of the union republic councils of ministers, would work up an integrated program of scientific research in the road construction field up to 1990. This program must reflect the development of new technologies and means for rapid road construction, problems of using new, effective, local materials and industrial by-products, nonfabric synthetic materials for construction of the earthen bed on weak foundations, and research to expand organic and inorganic binder resources. Broad research must be conducted into the development and creation of integrated systems of production control, of automated road and bridge design, and of construction quality control.

Several other road construction and maintenance problems also will be solved in accordance with the decree that was passed: creation of forested strips protected against snow, increased production of better grades of road bitumen, measures to reinforce cadres occupied in road construction, repair, and maintenance, development of expenditure norms for road repair and maintenance, provision for reliable communications on the roads, provision of lighting for road sections through population centers, and so on.

Efficient and complete accomplishment of all tasking levied for 1981-1985 by the CPSU Central Committee and USSR Council of Ministers Decree "On Measures To Improve The Construction, Repair, And Maintenance Of The Country's Roads" will be one vital prerequisite for increasing work efficiency and quality in our entire economy and for improving the spiritual and material well-being of the Soviet people. It will create prerequisites favorable for more effective and profitable work in future years.

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MOTOR VEHICLE

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IMPORTANCE OF ROAD CONSTRUCTION FOR DEVELOPMENT OF SIBERIA STRESSED

To the Oil Fields

Moscow AVTOMOBIL'NYYE DOROGI in Russian No 8, 1980 pp 4-5

[Article by Yu. I. Brunitskiy, chief engineer of Glavzapsibdorstroy, Professor V. D. Kazarnovskiy, doctor of technical sciences and department head at Soyuzdornii, and N. V. Tabakov, candidate of technical sciences, winner of the State Prize, and department chief at Giprotyumenneftegaz: "The Construction of Roads in the Western Siberian Oil Fields"]

[Excerpt] A significant network of vehicular roads has already been built in the oil fields of western Siberia. Since 1967 1,400 kilometers of hard-surface roads and about 3,000 kilometers of unpaved roads (chiefly side roads to well clusters) have been built. In 1967 19 kilometers of road with a capital investment of 12 million rubles were turned over for use; in 1979 205 kilometers with a total cost of 112 million rubles were built. In 1980 plans envision building 330 kilometers of hard-surface roads and more than 300 kilometers of unpaved roads. At the present time road construction is being done by two trusts of Glavzapsibdorstroy [possibly Main Administration for Road Construction in Western Siberia] of the Ministry of Transport Construction and three trusts of the Ministry of Petroleum Industry (the latter are building chiefly unpaved roads).

Construction of the railroads from Tyumen' through Surgut to Urengoy and from Surgut to Nizhnevartovsk was enormously important for development of the network of oilfield roads to the new deposits. These railroads are now providing stable shipment of most construction freight.

The needs of the oil extraction sector in the 11th Five-Year Plan demand a significant increase in the length of the road network now under construction.

For this reason the pace of construction had to be stepped up both by strengthening construction subdivisions and by employing progressive design and technological concepts and taking necessary organizational steps. In solving these problems it was necessary to consider, on the one hand, the characteristics of oilfield roads and, on the other, the natural conditions of the region.

The chief characteristic of main oilfield roads is heavy, intensive traffic involving various types of vehicles, including vehicles for hauling the heavy and outsized equipment needed for oil extraction. Only a hard (capital-type) surface can withstand such traffic.

The natural features of the region are the large extent of swampy territory, the large number of lakes and sectors with saturated clay soils, and the presence of permafrost in the northern rayons. For example, 60 percent of the famous Samotlor deposit is swamps, 20 percent is lakes, and 20 percent is waterlogged ground. Swamps comprise 66-73 percent of the territory of the Salymskiy, Kholmogorskiy, and Muravlenkovskiy deposits. As a result, for 40-80 percent of their length the roads cross swamps, there are considerable sectors with waterlogged ground, a large number of lake crossings, and the like.

Construction is further complicated by the lack of road building materials and earth suitable for construction of a stable roadbed in conformity with operative norms in the region. Reinforced concrete elements are shipped up to 3,000 kilometers and sand-gravel mixes comes from up to 1,000 kilometers away. The bed is made partly or completely of sand that is transported up to 40 kilometers, and a significant share of the sandy soils being used are processed first by hydromechanization. Fine-grained sands whose applications are restricted by Construction Norm 449-72 are often used in the roadbed.

Finally, it should be noted that the severe climate, length of the winter, low temperatures, and similar features are important.

These circumstances were taken into account in working out efficient methods of designing and building the roads. The first question to be resolved was the development and introduction of designs using peat soils in the base of embankments for capital types of road surfaces. Such ideas had not been used before, certainly not on a large scale.

Research studies conducted jointly by Soyuzdornii [State All-Union Scientific Research Institute of Roads and Highways], Giprotyumenneftegaz [possibly State Planning Institute for Tyumen' Petroleum and Gas Construction], its branch in Sverdlovsk, the Omsk branch of Soyuzdornii, the Tyumen' and Nizhnevartovsk Road Building Trusts, the vehicular roads department at TyumISI [possibly Tyumen' Construction Engineering Institute] with participation by Beldornii

(Belorussian Scientific Research Institute of Roads and Highways), the Kalinin Polytechnic Institute, and several other organizations and with technical support from the Ministry of Petroleum Industry and Glavtyumenneftegaz (Main Tyumen Production Administration for Extraction of Petroleum and Gas) made it possible to work out methods of planning and building oilfield roads in [illegible] using peat soils as the base of embankments and as the material for the lower part of the embankments. In view of the large scope of introduction of designs using peat as the base of the embankment, instead of special methods to accelerate compaction the so-called two-stage method of construction was developed, made possible by the use of precast surface slabs. Following this method, in the first stage the road bed is constructed and, after compaction reaches 60 percent, the surface slabs are laid down but not cemented together. This allows priority travel necessary for construction and oil workers. Then after compaction reaches 90 percent the slabs are lifted, the subgrade is leveled, a base of sand-gravel mix or other materials is laid, and the surface is cemented together.

Development of the methods of large-scale use of peats in the base and body of embankments required intensive and thorough study of their properties and regional classification of swamps and peats. All this made it possible to broaden a technique that had been considered unique into a large-scale, standard method. In addition, considerable work was done to substantiate the possibility and necessary conditions for using waterlogged local soils and fine-grained sands and to substantiate the designs of embankments for lake crossings.

We should note the large-scale incorporation of the use of hydromechanization both during extraction of sand from river floodplains and piling it and directly during construction of embankments, especially on bridge approaches and lake crossings (involving pumping up to 15 kilometers).

Ensuring rhythmic year-round construction was a major achievement. This included special organizational measures and the selection of design and technological concepts, in particular the choice of concepts that made it possible to do a significant volume of earthwork in the winter.

We must also note the large-scale use of precast surfaces composed of prestressed reinforced concrete slabs. Introduction of this type of surface on such a scale, and in such conditions, was new to world road construction practice. Practical experience with the use of precast slabs fully confirmed their utility under these conditions. While they are a capital type of surface, precast slabs also allow temporary use before the bed finishes settling. Moreover, this type of surface meets the requirement of year-round construction.

Scientific substantiation, use in plans, and practical introduction of these design-technological and organizational concepts made it possible to sharply reduce the volume of earthwork in general and the volume of shipped-in earth in particular during road construction. This allowed a substantial (one-third to almost one-half) reduction in the cost and labor-intensiveness of construction and cut energy-intensiveness by more than one-half. But the main thing was that it laid the foundation for a sharp step-up by more than one-half in the rate of construction of oilfield roads with capital surfaces.

The fully developed program of measures was introduced beginning in 1976. Its introduction made it possible to develop deposits at the required rate. The design concepts, proposed and tested in practice, are reflected in the departmental normative document "Instructions on Designing Vehicular Roads for Oilfields in Western Siberia." It has been approved by USSR Gosstroy.

A corresponding document on the technology of construction of oilfield roads under these conditions, reflecting accumulated experience, is now under development.

At the same time we should note those questions which are being worked out at the present time, whose solutions are very important for the continued progress of road construction in the oilfields of Western Siberia. First of all there is the development work related to use of synthetic textile materials in building the roadbed. These investigations aim chiefly at improving the designs of side roads to well clusters. Until recently wood beds have been used in building them. The great length of such roads built each year demands enormous amounts of lumber, because one kilometer takes up to 4,000 cubic meters of wood.

A design using a layer of earth 0.6-1.0 meters thick poured on top of a bed of synthetic textile material (STM) spread out on the ground surface has been proposed and tested in practice. This design eliminates the use of wood. The prerequisites for fairly broad introduction of this method have appeared in recent years: an enterprise of Soyuzglavvtorsyr'ya [possibly USSR Main Administration for Procurement and Processing of Secondary Raw Materials] has incorporated industrial production of the domestic STM "dornit," which was developed by VNIIStroypolimer [possibly All-Union Scientific Research Institute for Use of Polymers in Construction] and Soyuzdornii. The road building projects of the Tyumen' region are the principal user of this material (and in 1980 about 1 million square meters of it will be produced).

Under the conditions of Western Siberia STM can also be used widely in construction of roads with capital surfaces. Specifically, it has been proposed to replace the base of sand-gravel mix and the monolithic layer with a "dornit" strip. Experience indicates that this type of design works perfectly well because the "dornit" prevents the waterlogged sand from being squeezed out through the seams in the road surface.

Special research is underway to substantiate rational designs for reinforcing the shoulders and slopes of the embankments of oilfield roads (including study of the possibility of using STM's to reinforce slopes). Research on the use of various binding agents (cement, petroleum, bitumen, resins, and the like) under Siberian conditions is very important. Noteworthy among these projects is the research being done at TyumISI on prefabricated road design components made of reinforced ground prepared in autoclaves. Serious attention is being devoted to improving the quality of precast concrete slabs, improving their design (especially connecting elements), and reducing metal-intensiveness (Soyuzdornii).

Development of a planning system that uses computers is an important area of work. Considering the complexity of natural conditions, the volume of planning required in future years cannot be done on time without using computers. For this reason Giprotyumenneftegaz is now working on automation and optimization of planning. Appropriate concepts and means are already available for using a digital model of the terrain to obtain an optimal route in a region with nonuniform construction conditions and to optimize the network of roads. The calculation of volumes of earthwork has been automated, graph plotters are used to produce graphic materials, and a printer writes up records of work volumes.

Using aerial photography and the classification of swamps and regions worked out for our area in surveying work is a significant element in automating planning.

Completing all of these developments and introducing them in practice at the earliest possible time will promote continued significant progress in planning and building oilfield roads.

The experience we have gained in introducing our design-technological and organizational concepts has also disclosed a number of questions that must be solved as quickly as possible. One of them is improving the quality of roadbed construction. Use of the concepts we have developed presupposes heightened attention by construction workers to exact compliance with the planning concept and work technology, because these designs do not have the safety margins of traditional designs. Improving the quality of factory-manufactured slabs is a serious problem. Large-scale use of the slab presupposes high-quality manufacture at the factory. In general, the question of improving the quality of all construction is a paramount concern. And we must not forget the question of supplying construction sites with the equipment and instruments necessary to monitor quality. The quality of construction depends in large part on monitoring by the client and the author of the plan.

The question of using new types of surfaces, for example asphalt-concrete, in some cases is on the agenda. The use of such surfaces under Western Siberian conditions requires special study. The problem of compacting the slopes of embankments in swamps remains unsolved. Further efforts are needed to straighten out the production of better quality STM's, capable of broad use. Specifically, the STM's made from a polymer fusion on the equipment of the All-Union Scientific Research Institute of Machinery for Synthetic Fiber Production in Chernigov are promising.

Finally, the organization of repair and maintenance of oilfield roads is one of the most important matters. The special characteristics of these roads, the conditions of their construction, and finally the design concepts used demand heightened attention to repair and maintenance. Until very recently, however, there was practically no road repair and maintenance service at all. There are cases where sectors were put into use and traveled for more than 10 years with no repair. Naturally, the condition of these sectors may not meet traffic requirements. The characteristics of the prefabricated road surfaces -- the large number of seams that require constant care -- must be considered here.

It should be observed that the progress made in solving all the complex scientific and practical problems of building roads in the oil regions of Western Siberia is above all the result of harmonious working together by construction workers, planners, and scientists who are frequently separated by department but united by the common goal and common tasks.

The specially created Council on Coordination of Work in the Areas of Scientific Research, Planning, Construction, and Use of Oilfield Roads in Western Siberia, attached to Glavtyumenneftegaz, has played an important role in joining efforts and correctly allocating personnel. The Council includes representatives of virtually all organizations involved in construction of oilfield roads. It discusses work results, identifies priority problems and ways to solve them, and develops recommendations on directions of research by various organizations, forms of work coordination, performance of experimental jobs, and the like. Strengthening the work of this council and enlarging its role in planning research and design work as well as its introduction, plus giving the Council's decisions more weight, are important conditions for finding fast and optimal solutions to the scientific-technical problems now on the agenda and arising in the future.

Providing transportation arteries for petroleum extraction is a task of great importance to the state. The builders of vehicular roads have a decisive role in meeting this challenge.

Beginning in 1981 the Ministry of Transport Construction's Tyumen' and Nizhnevartovsk road building trusts will be joined in construction of roads to the oilfields by road building organizations of eight Union republics. These organizations now face the job of establishing the necessary production bases and living facilities this year.

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In Tyumenskaya Oblast

Moscow IZVESTIYA in Russian 12 Aug 80 p 3

[Article by L. Yanin, deputy chairman of the executive committee of the Tyumenskaya Oblast Soviet of Peoples Deputies: "The Roads of the North"]

[Excerpts] When geologists discovered the Samotlor petroleum deposit the event brought more than just joy; specialists were deeply concerned about how to extract the underground treasure. After all, the petroleum was hidden beneath impassable swamps. The lack of roads was the first obstacle facing operations workers who followed the geologists into the region.

Drilling and operations workers reached their "sites" with great difficulty. At the same time road construction workers were laying the famous "Samotlor ring," a concrete highway with roads radiating out to the drilling sites and fields. The paved road was very expensive, but the expenditures were fully justified.

Years of hard work are now behind them. Under the leadership of the oblast party organization local Soviets and economic subdivisions have done a great deal. The highway network was steadily widened, the production-technical base grew stronger, and labor collectives took shape. Carrying out the measures planned by the resolution adopted at the 1970 session of the oblast Soviet, the Tyumenavtodor [Tyumen' Vehicular Road] Administration and the Tyumen' and Nizhnevartovsk road construction trusts, with others, laid 2,146 kilombers of hard-surface roads. The volume of capital investment was 1,184,000 rubles. The total length of highways in the oblast increased by more than 1,000 kilometers during the 10th Five-Year Plan alone.

The capacities of road building organizations developed. Sixteen new construction and repair administrations, five motor vehicle pools, a bridge construction trust, and several other specialized subdivisions were formed within the system of the USSR Ministry of Transport Construction and the RSFSR Ministry of Vehicular Roads. They have equipment repair workshops, warehouses, and railroad sidings for receiving freight. And to avoid worker transience and attract people to work in the oil region for extended periods of time, 80,000 square meters of housing, children's institutions, and health facilities have been built for the road workers.

Unfortunately, this is by no means the situation everywhere. The volume of work has declined recently at Tyumenavtodor, the output per excavator, bulldozer, and scraper has declined, and labor productivity and the output-capital ratio are not growing. The administration has stopped its carefully planned work with cadres and is not trying to disseminate the know-how of progressive collectives. At most projects the machinery is used for just one shift, the brigade contract is not being widely introduced, and effective socialist competition has not been organized. The blame for this falls primarily on the leaders of Tyumenavtodor, of course, but it also involves failures of the local Soviets in whose areas the road subdivisions are working.

Another fact must also be admitted: the quality of highway construction in the petroleum-gas extraction regions has declined lately. The slabs are breaking down rapidly on new roads with reinforced concrete surfacing. About one-third of these roads need repair; repair becomes necessary roughly five years after they are put into use.

Recognizing the exceptional importance of developing the country's principal fuel-energy base, the CPSU Central Committee and USSR Council of Ministers adopted supplementary measures to boost construction work in the Western Siberian petroleum-gas complex. They focused attention on construction of housing and vehicular roads. In 1981 575 kilometers of highways are to be built in the northern rayons of our oblast, and then 710 kilometers in 1982 and the same in 1983. It is a very intensive program, if we consider that in the past about 200 kilometers a year were built.

By the end of the 11th Five-Year Plan the Khanty-Mansiyskiy and Yamalo-Nenetskiy autonomous okrugs, where most of the reserves of underground wealth are concentrated, will have 15,000 kilometers of roads, including 4,200 kilometers with capital-type hard surfacing. The problem of correct road maintenance will become paramount. We think that this will require establishment of a special road operations service modeled on the service that operates in the system of the Ministry of Vehicular Roads.

The increase in the volume of road construction will entail a significant increase in shipping by railroad, motor vehicle, and water transportation. The quantity of freight handled will triple. That is why the local Soviets have taken charge of monitoring the construction of additional rail sidings, loading-unloading platforms, cement storehouses, and river docks. A large amount of bitumen will be needed. For this reason Tyumenavtodor with the administration of municipal services and the oblast kolkhoz construction association have been assigned to construct a special installation with a capacity of 80,000-100,000 tons of bitumen a year as quickly as possible.

The people of Tyumen' are well aware of the complexity of their immediate and more remote tasks. We see our shortcomings and are trying to eliminate them. We must say, however, that a great deal depends on related sectors as well. In 1980-1983 the USSR Ministry of Building Materials Industry is supposed to deliver 1 million tons a year of crushed rock and asbestos waste from the Uralasbest Mining and Concentrating Combine to the builders of the Western Siberian complex and the Ministry of Railroads is to see that the material is shipped. But what is actually happening? The total crushed rock plan for the past 18 months was 1.5 million tons, but only 1,145,000 tons arrived.

We also have major complaints against our neighbors in Sverdlovsk, who are our principal suppliers of crushed rock. In the last four years their deliveries to us have been almost 2.5 million tons, or 24.7 percent, short of plan. We are especially displeased with the Ural enterprises of the Ministry of Ferrous Metallurgy; in the first four years of the five-year plan and the first six months of this year they have fulfilled only half of the plan. Moreoever, the crushed rock from these enterprises goes to make high-grade concrete and for main load-carrying design elements. Kemerovskaya Oblast, which has comparatively small delivery volumes and ships crushed rock directly to the construction sites of the petroleum-gas regions of the North, is not meeting its contract obligations. In the last four years it has shipped only 42 percent of the required amount.

We have set up an operational group at the oblast executive committee to monitor timely and accurate work in receiving and unloading incoming trains. They try to see that the principal freight recipients have adequate sidings and do not delay the cars beyond norms. But by no means all freight is coming in. Large amounts of gravel, sand-gravel mix, gypsum, lime, chalk, and reinforced concrete road slabs from various oblasts and republics have not "reached" us. I would like to mention bricks in particular. Since the beginning of the five-year plan we have received roughly 380 million bricks, but the plan envisioned more than 500 million. Our main administrations and associations used to have good working contacts with the Revda, Uktusskiy, and First Nizhniy Tagil' brick plants in Sverdlovskaya Oblast. The recipients of the bricks set up packaging there for northern conditions and helped out with personnel and equipment. Suddenly the Sverdlovskaya Oblast executive committee reduced shipments from these enterprises, assigning the Nazavayevsk and Irbit brick plants of the Ministry of Transport Construction to ship 7 million bricks to Tyumen'. They could not handle the assignment; in the first six months they delivered only 270,000 bricks.

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MOTOR VEHICLE

ROAD REPAIR IN GEORGIA: ACCOMPLISHMENTS, FUTURE TASKS

Tbilisi ZARYA VOSTOKA in Russian 20 Sep 80 p 1

[Article: "The Republic's Roads"]

[Excerpts] Over the past 10 years, the length of hard-surface, common-user roads increased by more than 2,000 kilometers and hundred of major bridges were constructed. Today, almost all of the republic's kolkhoz and sovkhoz central farmsteads have access to a supporting road network. During this five-year plan alone, the Tskhakaya-Poti, Leselidze-Gagra, Tbilisi-Bakurtsikhe, and Tsnori-Lagodekhi highways were reconstructed or underwent capital repair. Also, the Dzhvari-Khaishi-Mestiya highways were repaved with an asphalt concrete surface, making it possible to significantly increase freight and passenger turnover with Mestiyskiy Rayon. The Natakhtari-Khashuri-Kutaisi-Samtredia highways and the 50-kilometer Chumateleti-Zestafoni run also were repaved. Initiation of the reconstruction, upgrading, and architectural-artistic enhancement of the "Highway of Friendship"--the Georgian Military Highway, which always was and which remains a symbol of the immutable friendship and unity of the Russian and Georgian peoples, of all the peoples of the USSR, has become an event of great sociopolitical and socioeconomic importance. The first 5 kilometers of this route already have been placed in operation. Construction continues on the Rikotskiy Highway Tunnel, a by-pass around Gagra, and other highways.

At the same time, road construction in the republic lags behind national economic requirements.

It suffices to note that the average annual rate of growth of intercity freight shipments during the past period of the 10th Five-Year Plan made up 29.2 percent of the shipment volume and 41.8 percent of the freight turnover, which significantly exceeds the level of development of the republic's road network. Moreover, the technical condition itself of some of these roads does not meet the growing intensity of the vehicle transport traffic and carrying capacity.

The editorial board receives many letters from transport vehicle operators and other drivers complaining about the unsatisfactory condition of some highways. A great many complaints are directed to certain sections of such roads as Vaziani-Gombori-Telavi, Zestafoni-Chiatura, and Manglisi-Tsalka-Bogdanovka. Anxiety is expressed over the large number of "broken up," virtually unusable streets in Kutaisi, Surami, Zugdidi, Akhaltsikhe, Tskhinvali, and Samtredia. These shortcomings are explained by lack of attention on the part of certain party and Soviet organs locally to road development and to improved labor and domestic conditions for road workers. Extant capabilities are not fully used in several regions of the republic to expand the construction and reconstruction of local roads. Insufficient aid is given to primary party organizations and economic supervision of enterprises tasked with the responsibility to build and maintain roads, to step up work with cadres, to introduce progressive know-how.

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MOTOR VEHICLE

EXPERIMENTAL USE OF HYDROGEN AS MOTOR VEHICLE FUEL

Moscow ZA RULEM in Russian No 8, 1980 pp 10-11

[Excerpt] The experiment is conducted with a regular model RAF-2203 minibus. In its luggage compartment are placed Dewar flasks, also regularly manufactured in our country, containing liquid hydrogen. The automobile is shown in the photo [photo not reproduced]. Road tests reveal that adding 5 to 10 percent hydrogen to the gas considerably increases the fuel combustion ratio and increases the engine's efficiency by 40-45 percent.(Furthermore, the toxicity of exhaust gases is reduced by more than 99 percent (due to reduction of the carbon monoxide content). There are thus two very important benefits which the public expects of the modern automobile: saving and safety.

The two Dewar vessels shown in the photo of the automobile luggage compartment [photo not reproduced] have a total capacity of 80 litres. The weight of the liquid hydrogen in them is 5.6 kg. It is pumped from the vessels under a pressure of 1.5 kgf/cm^2 into a special container where it is evaporated and the gaseous hydrogen is piped to the carburetor. To determine the consequences of possible damage to the Dewar vessels in an accident liquid hydrogen was spilled from the vessel to the ground under pressure of 3 kgf/cm^2. It evaporated instantaneously and its vapors rose so rapidly and scattered in the atmosphere with such speed that they could not be ignited even at a small distance from the stream. The stream was somewhat like a stream of water pouring on a red-hot plate, but water vapor is 14 times heavier. Thus, even in emergency situations, when the hydrogen tanks are damaged, conditions for burning or explosion do not develop. At the same time, it is known that when gas tanks are damaged gas spilled to the ground can ignite and the flames can envelope a fairly large area.

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ROBOTS INSTALLED AT VOLGA MOTOR VEHICLE PLANT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Sep 80 p 1

[Article by SOTSIALISTICHESKAYA INDUSTRIYA Correspondent A. Vorob'yev, Tol'yatti: "Both An Assembler, And A Puncher"]

[Text] A new industrial complex quite recently appeared on the northern side of the Volga Automobile Plant [VAZ]. They produce starters here for vehicles built at the Kama Automobile Plant. But, the basic capacities were intended for Volga machine tool manufacture. The most complex automated lines are born from here. However, there is one more profession in the production business--making robots. Ye. Pavlov, chief of a design division, and I walk through the automatic manipulator assembly section.

"Here is our first product," Yevgeniy Artem'yevich points to a row of assembled robots. "More than 400 units already have been produced."

The robot is disappointing when you first see it: simply a white box with an electronic attachment similar in shape to a typewriter. On top is a steel hand with a claw. The dimensions are very modest, since the manipulator can move components weighing only up to 200 grams. But, closer familiarization produces respect for the simple and reliable machine capable of replacing the monotonous work of the puncher, assembler, and workers of other professions. The robot has respectable passport data: elevation of the hand 30 millimeters, movement 150, rotation 120 degrees, positional accuracy .05 millimeters. And, the mechanism operates quite adroitly: it requires only a half second to switch from one operation to another.

The MP-9S programmed penumatic robot was created by the Technical Cybernetics OKB [Experimental Design Bureau] at the Leningrad Polytechnical Institute. It already has been introduced at several Leningrad plants, which have sent good feedback to Tol'yatti. Several Kuybyshev plants also bought the manipulators.

Manufacture of large consignments of manipulators required great efforts by car builders. In particular, production of 200 plus components of second-class accuracy has been assimilated. The Volga workers themselves make an electronic control unit containing integral microcircuits.

They have their own specific plan for introduction of MP-9S manipulators there. Several units are being installed in mechanical assembly production. They will feed to the press red hot synchromesh unit rings, participate in tempering starter fingers, and so on. In press production alone, about 80 technological operations have been identified where robots can be used.

The workers at the Volga Plant have big plans. A new automatic manipulator, the MP-11, is being prepared for series production. It has two hands, one which can rotate 180 degrees around its own axis. Production of the Universal-15 manipulator is being assimilated and it is larger. It can move cargo weighing up to 15 kilograms and is more complex since it has an hydraulic system and digital program control. The first models of this machine should be assembled by the end of the year.

VAZ robot builders are still inexperienced, but the main thing is their attraction to a great and necessary state task, their desire more rapidly to solve the problems noted in a recent CPSU Central Committee decree.

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BRIEFS

VEHICLES FOR FAR NORTH--TASS reports from Kremenchug, Poltavskaya Oblast that the AvtoKrAZ Association has assimilated mass production of powerful heavy trucks for operations in the Far North and the Polar Region. The first consignments of such vehicles were dispatched yesterday to the builders on the Baykal-Amur Mainline and to lumberjacks in Krasnodarskiy Kray. Three vehicle models maximally adapted for Siberian conditions have been created based upon series-produced vehicles. Frost-resistant metals and materials are used in their manufacture. Preliminary warming of the storage battery and of the fuel has been introduced for the first time. A temperature of +20° is maintained in the cab even in the intense cold. Striving for a worthy greeting for the 26th CPSU Congress, the vehicle builders intend to increase production of the new heavy trucks. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Aug 80 p 2] 7869

GIANT CONTAINER LOADER--S. Leonov reports from L'vov that a new vehicle capable of lifting and moving standard containers of 5-20 tons capacity has been created and tested by the L'vov GSKB [Prime Special Design Bureau] for Autoloaders and by the Avtopogruzchik Association. The steel knight can operate on relatively small pads at warehouses and ports. The model's main innovation is a diesel engine and hydromechanical gear box. Series production of the new autoloader will begin before year's end. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Aug 80 p 2] 7869

AIR CUSHION PLATFORM--According to P. Antipin from the settlement of Novyy Urengoy, Tyumenskaya Oblast, the Tyumen'burgaz Association's vehicle fleet was augmented by an air cushion platform. The platform easily surmounts roadless areas and does not fear quicksand and very swampy terrain. The cargo platform can accept 20 tons of materials. Various equipment for oilfield workers and drill pipe can be transported by this platform. [Text] [Moscow PRAVDA in Russian 24 Sep 80 p 4] 7869

ROAD MACHINERY SHOW--PRAVDA correspondent Yu. Shpakov reported yesterday from Alma-Ata that the international Avtodormash-80 show closed. Thirty foreign firms and associations demonstrated machinery and equipment for road construction and maintenance. The show is of great interest to specialists and this is no accident. Great attention is devoted in the republic to road construction. The total length of hard-surface roads now has reached almost 70,000 kilometers. Modern equipment widely is used in construction of new highways. [Text] [Moscow PRAVDA in Russian 20 Sep 80 p 6] 7869

NEW UAZ MODEL--TASS reports from Ul'yanovsk that the first consignment of improved UAZ-469 off-road vehicles came off the line at the Ul'yanovsk Automobile Plant. This vehicle's reliability is well known, but it noticeably lacks comfort when compared to other vehicles. Now the "Uazik" rides smoother and its ventilation and heating system has been improved. This off-road vehicle is equipped with a new lighting system. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Aug 80 p 1] 7869

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RAILROADS

DEPUTY MINISTER CITES PLANS FOR DEVELOPING RAILROAD SYSTEM

Moscow PUT' I PUTEVOYE KHOZYAYSTVO in Russian No 8, 1980 pp 2-5

/Article by S. A. Pashinin, deputy minister of Railways: "A Program of Modernization and Development"/

/Excerpt/ The course which has been consistently promulgated by the Party and the government, aimed at the universal development of the economy of the Far East and Siberia, has led to the creation and expansion of such energy-engineering complexes as the Western Siberian Oil and Gas Region, the Kansko-Achinsk Territorial Complex, the Southern Yakutsk Coal Basin, and the Bratsk Timber Industrial Complex. Based on the largest operating hydroelectric power stations--the Irkutskaya, Bratskaya, and Krasnoyarskaya GES's--as well as the Zeyskaya, Sayano-Shushenskaya, Ust'-Ilimskaya and other GES's, rapid steps forward are being made by non-ferrous metallurgy, the coal and ore mining industries, heavy machine building, and many other extremely important sectors of the national economy.

In order to assimilate the new freight flows, the "Little BAM" was built and is in successfull operation: the 400-kilometer BAM--Tynda--Berkakit Line, along which the resources of Southern Yakutiya proceed to the "wide road" of the Trans-Siberian Main Line.

During the last few years a 695-kilometer steel track was also laid from Tyumen' to Surgut and was continued for another 216 km in 1979 to Nizhnevartovsk. And during the current year the rails will reach Urengoye (577 km will be added).

Incalculable natural resources will pour into our country's national economy, as the century's construction project--the BAM (Baykal-Amur Main Line) is built and put into operation; more than 1200 km of track have already been laid here, while stations and settlements are under construction. Through operating traffic has now been opened up on the very important Eastern Section of the BAM: the Urgal--Berezovka--Komsomol'sk-na-Amure. In 1981 it is planned to put into operation the first Western Section: from Ust'-Kut to Kunerma.

Beginning in 1978, railroad construction took on a large scope in the Kuzbass region. An extensive program was planned for expanding the transportation links of the Krasnoyarskiy Kray, Western Siberia, and providing egress from the Urals into the Volga and Central Industrial regions.

The following figures speak convincingly about the scope and pace of transport construction in Siberia and in the Far East. Within the planned increase of capital investments for the development of railroad transport during the last two years (1979--1980) of 11.3 percent in these regions (without counting the BAM) their growth amounted to 38 percent. As a result, the Vkhodnaya--Irtyshskoye and Central Siberian--Kamen'-na-Ob' Sections have been electrified, and operations are continuing from Irtysh to Kamen'-na-Ob'. The principal portion of the Sredsib (Central Siberian Line) will be converted to electric traction, and it will become a high-capacity, well-equipped and well-supplied line, capable of substantially relieving the load of the Trans-Siberian route. The Khabarovsk--Bira Section--the main portion of the Khabarovsk--Karymskaya route--has also been electrified. When electrification is completed on this route, electric locomotives will haul trains over the entire Brest--Khabarovsk route, for a distance of about 10,000 km.

Of course, the primary development of railroads in Siberia and in the Far East is harmoniously combined with the strengthening of the country's entire network and is closely linked with the expansion of the other types of transport--automotive (truck), inland-waterway, maritime, air, and pipeline; this consolidates and improves our Motherland's integrated transportation system.

In this connection electrification of the so-called "Kazan Route" has been developed; it links by the shortest way (through Murom, Kazan', Yanaul, and Druzhinino) the Central Region with the Southern Urals, as well as the following sections Bogdanovich--Tyumen'--Nazyvayevskaya, Buy--Danilov--Vologda, Orsha--Minsk--Brest, and a number of others.

On the principal sections limiting through capacity second tracks are being built, automatic interlocking and centralized dispatching are being installed, while junctions and stations are being developed. Thus, the stations of Khabarovsk, Irkutsk, Angarsk, Orsk, Perm', Nasosnaya, and Arys' are being converted into high-capacity operational and classification systems. The creation has begun of the essentially new, large-scale terminals of Ukladochnyy, Krasnoyarsk, Batevo, and others.

It is gratifying to note that during the current five-year plan the tasks of putting into operation the basic production capacities provided for by the national economic plan are being fulfilled every year. Over a four-year period this has permitted us to put into operation 2,740 km of second tracks and the electrification of 3,340 km. (Moreover, if in 1978 some 543 km were electrified, then in 1979 this figure was 1,317 km, while in 1980 another 1,300 km are supposed to be electrified). Some 12,500 km have been equipped with centralized dispatching and automatic interlocking.

In formulating plans and organizing construction provision is made primarily for carrying out operations which insure the most rapid possible increase of the through and traffic capacities of the railroads on particularly heavily loaded sections and routes. It is precisely for this reason that both the absolute and the relative greatest amounts of capital investments are being directed at the construction of second tracks, strengthening existing lines, rebuilding junctions and stations, modernizing means of communications, and improving the methods of organizing train traffic. Including electrification, these outlays comprise 44 percent of all investments in the capital construction of railroad transport.

The second tracks or double-track inserts which have been laid in recent years have substantially increased the traffic capacity of such routes as Tayshet--Lena, Alma-Ata--Mointy--Chu--Karaganda, Petrozavodsk--Belomorsk--Murmansk, Inta--Pechora--Rybnitsa, Ryazan'--Ruzayevka, Stryy--Mukachevo, Bakhmach--Gomel', Sennaya--Saratov, and many others.

Railroad construction, of course, has a great influence on the operation of the existing network. New dead-end lines (such as BAM--Tynda--Berkakit, Tyumen'--Surgut--Nizhnevartovsk, and the Synya--Usinsk, Idzhevan--Razdan lines now under construction) impose additional loads on the adjoining railroads, whereas new lines which are built parallel to existing main lines or within the existing network (such as Krasnodar--Tuapse, Kustanay--Uritskoye, and the Muraptalovo--Orenburg, Agryz--Krugloye Pole, Malinovoye Ozero--Lokot' lines now under construction), on the contrary, relieve them of loads.

The rebuilding of junctions and stations by means of laying additional tracks or entire yards, lengthening tracks, equipping switches with electrical centralization and pneumatic cleaning have substantially raised the level of operations; they have allowed us to speed up the processing of trains and to improve the organization of loading and unloading. With the correct planning of such rebuilding we could increase the length and weight of the trains on entire routes, and this would open up broad prospects for a subsequent upswing in hauls. As is known, such an initiative by the Moscow Railroad has been approved by the CPSU Central Committee and is becoming more and more widespread.

At first glance, all the measures described, connected with the development of railroad transport, pertain primarily to the activities of the traffic services, communications, locomotive, electrification, and power-engineering systems. This is not the case. They directly affect the working conditions of the track enterprises, increasing the load borne by the trackworkers. Here it is not just a question of an increase in the length of the main-line and station tracks, an increase in the number of switches, crossings, pneumatic cleaning equipment for the switches, and other facilities but also an essential change in the nature of the entire job to be done by the trackworkers in connection with the appearance of rail circuits, contact network supports, due to the characteristics of repairing track on electrified lines. All this obligates trackworkers to take part in coordinating plan documentation and quality control and the completeness of construction and installation operations.

In order to raise the over-all level of operational activity, it is of no small importance to provide a comprehensive development of all the branches of railroad transportation--locomotive, car, track, freight, and other systems, without which it would be impossible to obtain a full yield from the newly introduced capacities.

The extremely difficult situation which has taken shape in recent years with regard to the diesel-locomotive pool, as well as supplying the railroads with new types of locomotives, requires the urgent construction of new locomotive depots and the rebuilding of existing ones, along with points for technical inspection, outfitting, and rest homes for locomotive crews, and other facilities. It is precisely for this reason that over the course of the entire 10th Five-Year Plan the locomotive branch has been developed at a faster pace than the others: within a total increase of capital construction amounting to 67 percent during the years 1976--1980, outlays on the locomotive system have more than doubled. Also speeded up (with a growth of 73 percent) has been the redesign of the car system.

Taking into consideration that the condition and operation of rolling stock depends, to a large extent, upon the organization of its plant repair and guarantee of spare parts, the outlays for increasing the production capacities of specialized plants has doubled during the current five-year plan; moreover, the increase during the last two years amounted to 48 percent.

Great changes have occurred in track maintenance. Thus, during the five-year plan the volumes of capital construction in the branch have increased by 65 percent. But in contrast to the other systems, where with increased operations a serious deficiency in production capacities is felt, and filling this out absorbs the principal amount of the funds, in track maintenance the new construction, for the most part, pursues the goal of improving the on-the-job and daily conditions of the workers, improving safety equipment and fire-fighting equipment, insuring environmental protection, etc.

This is linked with the fact that over the course of the preceding 15--20 years there has been a considerable strengthening of the crushed-rock (gravel) and tie-preserving industries, as well as rail-welding enterprises and plants producing reinforced-concrete ties. The capacities of these enterprises cover the basic needs not only of the present day but also those of the immediate future. This also allows us to direct our efforts at building production and service areas both for PMS's (Track-Vehicle Stations) as well as track intervals /7/, of which, for example, more than 40 are being built during the current year. An ever-increasing scope is being attained by the construction of repair-operational centers, depots for track vehicles and workshops. A large amount of funds is being allocated for the creation of PMS production centers, which now constitute capital, technically well-supplied, industrial-type enterprises, having at their disposal all the necessary means of mechanization, production-service buildings, and, in a number of cases, indoor workshops for assembling units.

In order to insure fire safety at the tie-preserving plants, fire depots are being built, and special water pipes are being laid. For the purpose of protecting the nearby environment, up-to-date dust-removal systems are being installed at crushed-rock plants, and purification facilities are being put in at tie-preserving plants. Where necessary, a number of railroads are building or rebuilding rail-welding trains, tie-preserving and crushed-rock plants with an increase in production capacities with regard to welding rails, preserving wooden ties, and crushed-rock output, by improving the technology and the quality of the output produced, taking into consideration the rise in the standards of production and labor productivity.

More than a third of all the funds allocated for construction and installation operations in the track branch go for the construction and reconstruction of engineering structures--bridges, viaducts, pedestrian bridges, and tunnels. This is an extremely important and responsible matter, since many bridges were built in accordance with the norms of the last century, and some of them need to be replaced without delay.

Serving as another item of common interest among the constantly increasing capital investments in track maintenance is the acquisition of track vehicles and machinery; this is linked with the need to carry out ever increasing amounts of track repair and to raise the level of its mechanization. Also of essential importance in this matter is the constantly increasing cost of track vehicles and their being supplied with expensive automatic systems.

Naturally, along with strengthening the production base of all branches of transportation, we are also conducting large-scale construction of housing, schools, kindergartens, hospitals, clubs, and other non-production social-service and mass-cultural facilities. Without them it is impossible to create appropriate daily living conditions for railroad workers and the members of their families. In a number of places the level of these conditions is still considerably behind the requirements, and this sometimes plays a decisive role in the matter of reinforcing personnel, increasing their skills, and, in the final analysis, it has a noticeable effect on raising labor productivity.

All these and many other important tasks of capital construction (their purposive direction, concentration of funds, reducing the volumes of unfinished construction, cutting down the time periods and improving the quality of operations, reducing costs, etc.) in railroad transport are being resolved in accordance with the directives of the Party and the government. These have found their expression in those principal conclusions which were drawn in L. I. Brezhnev's reports at the November (1978 and 1979) Plenums of the CPSU Central Committee, as well as in a number of special decrees regarding transportation.

Behind the positive results, however, it is impossible to avoid seeing numerous and serious deficiencies. A critical analysis of them and their fastest possible elimination is not only the direct obligation of each supervisor and engineer but also constitutes a great reserve for the further improvement of the entire matter of capital construction and, consequently, the most rapid extrication from "bottlenecks" in the work of transportation.

The principal deficiency is that the annual plans for capital construction are still not being carried out. For example, last year the assimilation of funds for capital construction as a whole amounted to 94.1 percent, while the figure for construction and installation operations came to 93.6 percent. This delayed the introduction into operation of a number of projects necessary for transport, increased the amount of "unfinished projects," and reduced the effectiveness of capital investments from which there is still not the necessary productive return. Great concern is caused by the fact that, in recent years as the annual amounts of construction and installation work has grown, the percentage of funds allocated is being assimilated less and less. The principal reasons for such a situation is a shortage of workers as well as of certain types of machinery, materials, and structural components in the construction organizations.

Transport bears great losses from poor operational organization, lack of proper coordination among individual performers, violations of discipline, idle times, stoppages, and unauthorized absences from work, as well as a poor quality of construction, which requires things to be done over again. This pertains primarily to the organizations of the Ministry of Transport Construction, which carry out 80 percent of all construction and installation operations. Last year alone on the existing railroad network they under-fulfilled their operations by a total of 197 million rubles (not counting over-fulfillments on the BAM and the subway). Unfortunately, and for essentially the same reasons, the railroads also failed to assimilate 5.2 million rubles.

Serious deficiencies in capital construction are linked with omissions on the part of railroads acting in the capacity of clients. At times technical specifications are not issued on schedule or fully, necessary materials and structural components are delivered late, delays are permitted in removing structures which interfere with new construction, there are delays in the excavation of pits and in the issuance of security notes. The "windows" (gaps) are often disruptive, equipment is delivered too late, as are also the completion of subcontracted operations linked with the rebuilding of existing installations, and locomotives and cars are not provided. All of this slows down the pace of construction, reduces its efficiency, and worsens the over-all results. Quite a few difficulties arise because of miscalculations in planning; a great scattering of construction projects still takes place, and this hinders the concentration of efforts and funds; there is improper coordination among the time periods for erecting individual facilities, and this causes excessive transfers of construction sub-divisions to new sites.

At times the unjustified violation of a situation which had taken shape with volumes and points of construction has led to a loss of skilled personnel (as was the case, for example, during the electrification of lines and on bridge and tunnel projects) and of general production capacities of construction organizations. To restore them, as experience has shown, then requires not only material and technical outlays but also, and mainly, a considerable amount of time.

A deficiency which is often encountered in capital construction is the incomplete construction of projects; this lowers the efficiency of utilizing newly introduced fixed assets and creates difficulties in their exploitation. Completely unallowable are the instances, which still do occur, of accepting structures with a low quality of workmanship and even with large parts still unfinished; this hinders the normal operation of such facilities.

Analysis of all these causes indicates that many are directly dependent on the clients--the railroads and the main administrations of the Ministry of Railways. Their managers ought to decisively improve planning and operational leadership in the field of capital construction.

Also suffering from deficiencies is the comprehensive system of planning capital construction, as determined by USSR Gosplan. Despite a certain annual increase recently in funds allocated, their over-all level has remained extremely low. And it is not by accident that the planned amounts of the basic operations during the current five-year plan are considerably less than not only the plans but, according to many indicators, also than their actual fulfillment during the Ninth Five-Year Plan. This contradicts both the existing conditions of transport operation as well as the tasks which are connected with the growth in the volume of hauls and an increase in their distance, especially of such bulk freight as coal, petroleum products, timber, and others, in the immediate future.

Along with an increase in the volume of production construction, there has also come about an acute need for expediting the solution of the housing problem in railroad transport. Despite the fact that the Ministry of Railways every year, according to the established procedure, switches over to housing construction, in addition to the limits set by Gosplan, tens of millions of rubles (by means of a forced reduction in the number of production projects), the guranteed supply of housing for railroad workers still significantly lags behind the general level for the country as a whole. Such a situation, which became one of the principal causes of personnel turnover, must be corrected within the shortest possible time period.

Railroad transport is frequently and justifiably subjected to criticism on the part of many ministries and departments--shippers and receivers of freight, Soviet and Party organs. Gosplan must adopt more active measures to eliminate as soon as possible the causes which are holding back the improvement of railroad operations. All the more appropriate on this account are the extremely pertinent directives of L. I. Brezhnev, which he uttered at the November (1979) Plenum of the CPSU Central Committee. He emphasized that it was necessary within the briefest possible time to change the situation in transport for the better, to work out a long-term, comprehensive program for its development, to decisively increase the responsibility of the transport ministries and of USSR Gosplan.

It is natural that simultaneously with an increase in the volumes of capital investment Gosplan must also solve the problems of increasing the plans for contractual operations. This may be accomplished either by means of increasing the load of the Ministry of Transport Construction's organizations by operations on railroad projects which still comprise only 46 percent of the total volume of operations being carried out by this ministry, and, this, of course, is obviously insufficient, or by means of a more active participation in railroad transport's construction projects (and primarily in the construction of housing, plants, locomotive and car depots, and other production facilities) by the organizations of other construction ministries. Of course, in the five-year plan which is at hand the Ministry of Railways must also sharply increase the production capacity of its own construction sub-divisions, including the railroad construction trusts.

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to a minimum. These routes were developed by A. Antonyuk, assistant traffic chief of the road's Odessa Division, and N. Kotovich, deputy chief of the oblast grain products administration. Every three or four days, the ring-shaped routes are reviewed, and changes are made if necessary in view of the grain flow which has developed.

The collectives of railroad stations and grain receiving centers are working in close contact. Comprehensive socialist competition agreements have been concluded among them and unified brigades to service and prepare cars to receive grain have been created. Supply workers in both departments have also joined efforts and are coordinating their work. This has permited the fast and flexible solution of many problems, and it is for good reason that the presence of station and grain receiving center leaders at the sorting operations center is mandatory.

Here is the result: in August, the "peak" period, grain transport workers in the southern Ukraine and the Odessa Division significantly exceeded the schedule for grain shipments, and more than half the grain hauled was accounted for by cement haulers.

These days, the coordination center of the Odessa Transport Center created under the ispolkom of the oblast Soviet of People's Deputies is working especially tautly. Precisely coordinated actions by railroad and port workers and motor transport workers is now required. The coordination center also solves major problems of the transport center.

"On the whole, grain shipment is quite good for the Odessa Railroad," says I. Shevernyayev, road first deputy chief. "There are no jams. True, a slight delay in the schedule was noted in the Kherson Division, but additional rolling stock have now been sent there, and the division will be on schedule in the next couple of days. We railroad workers now have no great concern about the grain. It is our primary task to ship all of it and protect all of it, down to the last grain."

September Figures

Moscow GUDOK in Russian 28 Sep 80 p 1

[Text] As usual, autumn is bringing field workers surprises: first it is sunny, then drizzly. This is when farmers are hurrying to gather in the grain. It is still the heaviest harvest period and railroad workers are actively involved in it. During the first 25 days of September, the plan for loading grains was overfulfilled by the October, Baltic, Belorussian, Donetsk, North Kazakhstan and Alma-Ata railroads. They shipped out more than 1,000 grain cars above their assignments.

However, railroad workers of the main grain-shipping routes, such as the Virgin Lands, Kuybyshev, Volga, South Urals and West Siberia, have not yet geared up to a high tempo. The commanders of these railroads have not yet been able to set up an uninterrupted supply of empties to grain shipment

RAILROAD

PROBLEMS IN GRAIN TRANSPORT DESCRIBED

Cement Carriers Used

Moscow IZVESTIYA in Russian 28 Aug 80 p 2

[Article by F. Chernetskiy Special Correspondent for IZVESTIYA, Odessa: "Attention: Grain Car!"]

[Text] Even quite recently, the "field - threshing floor" sector was the most strained link in the transport conveyor; then the "threshing floor - elevator" sector. And now the railroad workers are involved, and it is their busiest time.

...Responsible workers of the Odessa Division of the Odessa Railroad and the oblast grain products administration assemble each day at the sorting gate. The roll call begins at 1300 hours.

The Odessa Division is the most strained division on the Odessa Railroad, and understandably so: it serves five ports. And grain is now going by sea. Transporting the grain from the new harvest depends largely on how rolling stock arriving at the ports is processed, or more accurately, on how it is unloaded. But there are quite a few difficulties associated with rolling stock, and more so with covered cars. All of which was anticipated. Cement haulers are therefore used to carry the grain. It has been estimated, pondered and concluded that some cement haulers could be released to haul grain without harming cement shipments. Centers to wash out cement haulers and prepare them for carrying grain have been created at Slobodka and Davlet-Agach stations.

What is the advantage of cement haulers? Grain is loaded into them in exactly the same way as into ordinary covered rail cars. And it is considerably easier and faster to unload them, and also, fewer people are required. True, when cement haulers are unloaded, an adaptation is needed to receive the grain from below, but that was anticipated: such attachments have been installed at the large grain-receiving centers.

Cement haulers are generally arranged in "turntable" fashion -- consists of 12-15 cars. The "turntable" routes are ring-shaped. Empty runs are reduced centers. And in certain places, procurement workers are not utilizing all the cars supplied. On a majority of these roads, the transport and procurement organization commanders split the "sins" among them. We can hardly be reconciled to such phenomena. The common cause of delivering grain on schedule suffers. Railroad workers are obligated foremost to supply all the cars needed but at the same time must be more demanding that procurement workers use the rolling stock sent them.

Time will no longer brook any delays. Grain must be delivered promptly to the granaries.

The fate of successful cereal-grain shipments is now being decided at the main grain-loading stations, and success will depend on how efficiently the leaders of the departments can take steps to provide these centers with empties at the proper time, on how well they set up supervision of this work.

Here is how grain was loaded on average per day during the first 25 days of September by the deciding divisions of the network and what plan fulfillment results (in cars) were for the first 25 days of September:

division	division chief	loaded planned	loaded actual	+/- monthly plan
Stavropol'	A. P. Kikalov	45	84	+ 975
Kuybyshev	I. T. Travnikov	76	102	+ 650
Kustanay	B. I. Rubinshteyn	156	181	+ 625
Odessa	N. M. Kravchenko	24	46	+ 550
Krasnodarskiy	G. T. Melikyan	154	165	+ 275
Sal'sk	R. B. Negrebetskiy	38	48	+ 250
Rtishchevo	P. A. Oleynik	98	104	+ 150
Volgograd	B. P. Shimbarev	125	69	-1,400
Tselinograd	A. U. Kasymov	201	155	-1,150
Orsk	M. A. Kokurkin	107	66	-1,025
Kokchetav	A. M. Makhumedaliyev	168	131	- 925
Penza	V. G. Chebotarev	58	23	- 875
Karasuk	K. P. Nikolaychuk	52	20	- 800
Kartalinskiy	D. V. Sokolov	85	58	- 675

As we see, the most important divisions are not meeting shipment plans. However, it is not just a question of the plan. There are also additional assignments which must be carried out as obligatorily as must the plan. That must not be forgotten.

It is for that very reason that now more responsibility than ever before is being placed on roads returning empties. This has already been stated, but the situation has not improved. The leaders of mainlines returning empties continue to violate execution discipline. The Central Asia Railroad (road chief A. Kadyrov) failed to provide 540 empties daily, the Far East (A. Andreyev) -- 320, the Moscow (I. Paristyy) -- 280, the Transcaucasus (L. Vardosanidze) -- 200, the Azerbaijan (F. Kengerli) -- 170, the East Siberia (acting chief A. Dolgiy) -- 90, and the Transbaykal (A. Palekhov) -- 40.

Measures Taken

Moscow SEL'SKAYA ZHIZN' in Russian 6 Sep 80 p 2

[Article by USSR First Deputy Minister of Railways N. Konarev: "With a View Towards Protecting Grain in Shipment"]

[Text] The Ministry of Railways has reviewed I. Puzyrev's correspondence published in the 15 July issue of SEL'SKAYA ZHIZN' ("In the Wind and Under the Wheels"). With a view towards protecting grain in shipment by rail, on 29 July an order was issued "On Steps to Revitalize the Fleet of Closed Cars." The railroads have been set higher 1980 plans for closed car maintenance in depots. In this order, the ministry categorically prohibits transferring closed cars in disrepair from one road to another.

Moreover, in accord with the plan of ministry measures, closed cars are being revitalized during depot routine uncoupled maintenance and at shipment preparation centers. Implementation of the assignments set is being constantly monitored.

All railroads have run checks on the retention of grain in shipment, first of all in terms of car preparation quality, proper distribution of grain in the cars, the installation and proper fastening of grain panels, and switching procedures at stations with cars loaded with grain.

All incidents of grain not being protected in shipment are being investigated and those to blame are being called to account. G. V. Davydov, traffic service chief and deputy chief of the Northern Caucasus Railroad, was reprimanded for failing to take steps necessary to ensure protection of grain shipped. V. P. Rudoy, freight service chief for the Odessa Railroad, has been strictly warned. The attention of Donetsk Railroad car service chief A. M. Yanov has been called to a lack of proper educational work among car worker collectives.

Grain groups which monitor the timely and careful shipment of grain and other agricultural produce around the clock have been organized in the ministry and in the railroads.

Technical and commercial train and car inspection points have been set up. The are provided with the necessary staffs, materials and tools to eliminate deficiencies in cars.

The USSR Ministry of Railways and Ministry for Procurement have issued a joint instruction obligating railroad leaders and grain-products administration chiefs to take additional steps to ensure that grain shipped will be protected.

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RAILROAD

PROBLEMS IN FUEL TRANSPORT CITED

Figures for August

Moscow GUDOK in Russian 3 Sep 80 p 1

[Unattributed article: "Fast Delivery for Urgent Freight"]

[Text] August has not brought anything new in fuel shipments as our transport as before has not met the quota. By the end of the month, the backlog rose to 3.5 million tons of coal. The reasons for the lag are the same: the slow traveling of the loaded and empty gondolas and tankcars, the poor preparation for loading, and the unreliable delivery of empty rolling stock. For example, on 25 August alone, the railroad workers did not deliver 1,183 cars to the mines, including: the Donets Railroad was short 308 cars, the Tselinnaya [Virgin Lands] Railroad 279 cars, the Kemerovo Railroad 226, and the Eastern Siberian Railroad 268. On 26 August, the railroad workers were close to fulfilling the technical plan. As for the network just 49,200 tons were not loaded. This day the Northern Caucasus, Southeastern, L'vov, Sverdlovsk, Eastern Siberian and Transbaykal railroads operated well. But, of course, the overall result was most influenced by the basic coal-shipping roads, the Donets, Kemerovo, Northern, Tselinnaya and Alma-Ata which on this day did not fulfill the quota.

How did the railroad workers do on the last day of August? They failed to provide the miners with 1,933 gondolas. Only five railroads fulfilled the quota for coal shipments: the Northern Caucasus, Northern, Odessa, Tselinnaya and Eastern Siberian. The Donets Railroad shorted the mines by 867 gondolas. But also due to the fault of adjacent railroads, all in all 1,366 gondolas were not used. The miners were also let down by the railroad workers of the Pridneprovskaya, Moscow, Alma-Ata and Far Eastern railroads.

As a total during the month, the quota was fulfilled by just five railroads: Sverdlovsk, Eastern Siberian, Transbaykal, Southeastern and Northern Caucasus.

We are often inclined to criticize the coal-shipping railroads for the nonfulfillment of the quota, but the figures also show that the regulating mainlines are also to blame for this. For example, in August as an average per day they shorted the Donets Railroad by 599 cars, 499 cars for the Kemerovo Railroad and 144 cars for the Tselinnaya Railroad. And in the last days of August the Baltic, Gor'kiy, L'vov and Northern Caucasus railroads began to turn over more than the planned number of make-up gondolas.

The Northern Caucasus Railroad has improved the situation with the transporting of oil products. From 23 through 27 August alone, this line dispatched 284 loaded tank cars above the quota. The last day of the month was a record, with 440 tankcars loaded above the technical plan! Things are also going well on the Southern, Pridneprovskaya, Donets and Azerbaijan railroads. At the same time, there is an alarming situation with the loading of oil products on the railroads of the Volga Region, the Urals, Siberia and the Far East. As a total for the railroad network, on 27 August, for example, the railroad workers had not delivered 1,554 tankcars for loading. And on the last day of the month, the overall shortfall was 1,035 tankcars.

Problems at Mezhdurechensk

Moscow GUDOK in Russian 3 Sep 80 p 1

[Article by I. Kachura, Chief of the Mezhdurechensk Station: "How to Make Up the Arrears?"]

[Text] This year the Mezhdurechensk stationworkers owe the state more than 800,000 tons of coal. Each month the debt increases. And the misfortune is that we are unable to make up the debt. For 6 months running, we have received less than our quota of gondolas. And we lack them now. In July alone, as a result of energetic measures undertaken by the leadership of the Ministry of Railroads, the supply of empty rolling stock has increased, and for this reason we have met our operating plan for loading fuel and even dispatched 14,000 additional tons.

However, the quota of the ministry has not been fulfilled. And at the same time the coal workers have refused the gondolas four times. Is it not strange that rolling stock is in short supply and at the same time it is not required? The problem is that we are given a quota to carry out the fuel which is mined plus stocks at the storage piles. At present, the enterprises served by the Tomusinskiy Industrial Transport Administration have 408,000 tons of coal in storage. But a check disclosed that 225,000 tons at present can virtually not be loaded.

However, the miners shamefully keep quiet about this and even conceal the true state of affairs. In order that the coal workers recognize the unrealistic nature of the plan and issue refusal orders, we should promptly supply empty rolling stock for loading, even if there is nothing to load. But we cannot follow such experiments, while we know that the rolling stock is essential for other stations where coal actually exists today.

The accelerated shipping of fuel is greatly complicated by the poor movement of the trains to the east. For example, in August the Abakan Division of the Krasnoyarsk Railroad did not accept 195 trains from us.

On 14 August, at the four receiving and dispatching points for the eastern fleet there were nine trains destined for Tayshet, Nakhodka, Khasan, as well as two empty Korshunova circuit-working trains. We were compelled to send four units to park "B." As a result, the handling of the coal trains from the PTU [Loading and Transport Administration] was delayed, the distributing of local freight was made more complicated, and empty cars stood idle waiting for the make-up tracks. This sort of thing happens daily at our station. It is time, finally, for the main traffic administration to impose order at the Mezhdurechensk junction.

Regardless of the difficulties, the collective is doing everything to dispatch fuel as quickly as possible for the winter stores. In employing advanced labor methods, in improving production methods, and in relying on cooperation with related railroads, we are working for the efficient use of the rolling stock. For example, in the first half of August the stoppage of a local freightcar was reduced by 6 hours, by 5 hours in one loading operation, and by 2 for a transit car with reprocessing. The best results in the pre-congress competition have been achieved by the shift of the switching dispatcher A. Ustyuzhanin and the station dutyperson, the honored transport worker of the RSFSR, O. Khlebnikova.

But the collective needs immediate help to make up for its coal loading debt.

Ekibastuz Coal

Moscow GUDOK in Russian 6 Sep 80 p 1

[Article by the GUDOK brigade F. Batkin, L. Turov and A. Shirokov, Ekibastuz--Pavlodar: "Unit Trains on a Long Run"]

[Excerpt] The coal trains leave Ekibastuz in various directions, and the empty rolling stock comes back both smaller in number and poorer in quality. Often gondolas arrive here which are unfit for loading, they must be uncoupled and there are no facilities for mass repairs. Then the operations of the station and the spurs are disrupted, the cars "settle" here, depriving the junction of maneuverability.

We might stipulate that at present the situation has changed but this was the case. The railroad workers did not succeed in promptly delivering the empty units to the mines, and then the machinery halted and coal mining ceased. In order to prevent this, everyone at the junction operated under a great stress.

In a word, the fuel shipments came at a great price. The Tselinnaya Railroad and the main traffic administration of the ministry sought out ways for improving the complex process of long-distance coal delivery. As usual, the experience of production innovators helped. Practice showed that the transporting of power raw materials, for example, from the L'vov-Volynskiy Basin or from the mines of the Donets Basin to nearby power plants using "unit trains" provided good results. So what about using this method in moving the large masses of Ekibastuz fuel?

Before starting the experiment, involved calculations were made which would determine the optimum traffic variations for the circuit-working trains weighing up to 5,000 and more tons. Consolidated routing schedules were created for them. In order to eliminate the empty run, provision was made for maximum loading on the return leg. Thus, cars emptied of coal in Zolotaya Sopka travel to Magnitogorsk loaded with ore and are then returned to Ekibastuz.

While the technical and organizational preparations were underway, the unit trains were put into service one after another. The train dispatchers mastered the tight schedule, and the locomotive crews made trial runs with the heavy trains at high speeds.

It was soon apparent to everyone that the new method of shipping coal was fully effective. In actuality, while previously the abundance of malfunctioning cars in the empty units seriously disrupted the operations of the Ekibastuz junction, now, when the unit trains are made up of well-repaired solid-bottom gondolas with roller bearings, the problem of their additional preparation has disappeared. In coming back from the power plants, without any particular delay they are sent to the mines for loading. An average of 3.7 hours is spent on inspecting and overhauling the malfunction discovered in a so-called network empty car, but the processing of the unit train takes just 0.9 hour. Thus, 6,000-car hours are saved per day. Ekibastuz Station can breathe more easily, as the flow of "heavy" empty cars in no way overwhelms it.

Time is also gained in unloading coal at the power plants. The car tilter rotates and then puts any "crating" back on the tracks, but if the car is equipped with sliding bearings, another quarter of an hour is needed to repack the lubricating boxes. But a car with roller bearings can be dispatched immediately after unloading.

Thus, the experiment justified the hopes of the railroad workers. Now 156 circuit-working trains are hauling Ekibastuz coal, and this is 80 percent of the entire rolling stock delivered here.

One of the fans and supporters of the current shipping method, the chief of the coal and ore department of the Traffic Service of the Tselinnaya Railroad, Yuriy Moiseyevich Volobuyev, who follows the movement of each unit train not only on his own railroad but also on the neighboring ones, has summed up certain results of the new operations: loadings over the last 8 months, in comparison with the same period of the previous year, rose by 143 cars per day. Also characteristic is the important detail that the power plants which are supplied with fuel by the circuit-working trains are "better" stocked with fuel for the winter season than those which receive it, as before, by the network units.

The new operations require stricter traffic discipline on all the railroads handling the unit trains, the work cannot be approached using the old measures and habits, and it tolerates neither local interests nor a parasitic attitude which in some places still surfaces. Is it tolerable when the Southern Urals and Sverdlovsk railroads hold up the empty cars destined for Ekibastuz coal, thereby disrupting the rhythm of the "large ring"? And it is even worse at the Alma-Ata Railroad. Since the start of this year, around 90 circuit-working trains have been taken over for the needs of this railroad and diverted from the hauling of fuel for the power plants. And generally speaking these mainlines still have not realized the obligation of a preferential treatment for the unit trains and they hold up the fuel conveyor.

We have watched while powerful rotary machines have stood idle at the Bogatyr' mine merely because there were no empty cars. The cars at this time were somewhere far away from Ekibastuz. On individual days the coal miners fail to receive two or three unit trains. And the adjacent railroads are to blame for this.

Incidentally, the Tselinnaya Railroad has still not done everything to make certain that the progressive methods operate continuously and provide a greater effect. In developing the competition for exemplary fuel shipments, its commanders are more concerned with dispatching the coal, and they are doing everything within their power to increase the pace, but here are acting at times solely from self-serving positions. According to the rational system, the loaded trains should be dispatched via Petropavlovsk and Presnogor'kovskaya for the Sverdlovsk and Southern Urals railroads. But on these routes, the operations of diesel locomotives have been poorly organized, there are many engines out of operation and hauling is difficult. Instead of organizing things there, the local commanders divert the coal flow to Tobol'sk which is the most congested junction on the Southern Urals Railroad. The question is further aggravated by the fact that at this junction there is a weight train. Groups of cars are uncoupled from the units trains and these cars then for days chase after the basic section of the train, and are often simply lost en route.

The leaders of the Tselinnaya Railroad are well aware that the Tobol'sk junction (like, incidentally, the Chelyabinsk one) cannot rapidly process unplanned traffic, but nevertheless they continue to send this there. Are they not aware that this slight local advantage of more rapidly turning over the consists to the neighbors ultimately ends up bad for the Tselinnaya Railroad itself? It is very late in receiving back the empty cars, and the rhythm of coal loading is disrupted.

Life has shown that in order to speed up the delivery of the Ekibastuz coal to the power plants and eliminate the losses in hauling, it is essential to develop comprehensive competition of the adjacent railroads. For this purpose the representatives of many power plants, railroads and coal strip mines recently met in Ekibastuz with the Pavlodarskaya obkom of the Kazakh Communist Party. They outlined the ways for introducing the new shipping methods and the political support for this important task, they approved taut socialist obligations, and signed an agreement for labor cooperation.

The comprehensive competition for the railroad workers, coal miners and power workers to fulfill the joint precongress obligations is a dependable path to general success.

Problems at Kemerovo

Moscow GUDOK in Russian 6 Sep 80 p 1

[Article by GUDOK correspondent V. Denisenko from Kemerovo: "Kemerovo Paradoxes"]

[Text] During the 8 months of the current year the railroad workers of the Kemerovo Railroad have dispatched 1.53 million tons of coal less than in the same period of last year. The railroad possessed the locomotives, the capacity and the personnel, but did not meet the quota for fuel shipments.

The collective of the mainline is accelerating the car turnaround. The stoppages in one loading operation are declining. It is operating with a much smaller fleet than last year. And here each day 200 or so fewer cars are loaded than a year ago. Is this not strange?

The problem is that in the first half of the year as a daily average the fleet of empty cars along with the reserve of the MPS [Ministry of Railroads] was 698 units less. The delivery of rolling stock to the coal workers was also 378 gondolas under. The car shortage became one of the reasons for the nonfulfillment of the loading plan.

In July, after the radical measures approved by the MPS, the railroad each day had 1,835 units more empty cars than in the same month of the previous year. As a result, the state loading plan was overfulfilled, but the increased quota was not met. Over the 8 months, the lag behind the technical plan reached 12 million tons of coal.

The main problem is that the empty cars are turned over spasmodically, and around 40 percent are received by the railroad during the final hours of the report days. The situation is aggravated by the fact that the railroad workers of the Kemerovo Railroad and the commanders of the main traffic administration are more concerned with fuel loading and not with shipping it out of the Kuznetsk Basin. The Kemerovo Railroad has been turned into a holding tank for abandoned eastern trains. For this reason the coal trains stand idle for days on the spurs, stations and sidings.

In order to receive steadily the daily 4,580 gondolas for making up the fleet, trains must be received without obstacle from the Western Siberian Railroad. But the Kemerovo Railroad is unable to provide normal acceptance. The excessive transit car fleet to the east prevents this.

From the end of March to the middle of May, the Krasnoyarsk Railroad received the trains comparatively steadily. But then things turned bad. The Mezhdurechensk junction was particularly busy, and as a result each day 30-40 east-bound abandoned trains piled up on the Kemerovo Railroad. These basically were at the Belovo and Novokuznetsk divisions. And it is here that almost all the Kuznetsk coal is loaded. These trains tied up the stations of the Southern Kuznetsk Basin.

Each day the Tayga dispatchers sent out at least five locomotives as a reserve to Mariinsk. But on the leg of Bolotnaya--Mariinsk there was more than a score above the required. And at this time at the Kemerovo subdivision of the Tayga division there was nothing to pull the coal trains. Each day 10-15 engines were lacking. And the units at the stations of Biryulinskaya, Zaboyshchik and Latyshi stood idle for an average of up to 3 days awaiting departure.

Thus, in order to load coal in the Kuznetsk Basin, it is essential first of all to haul it. This is impeded by the poorly organized passage of the eastern trains over the interroad junctions. The main traffic administration must analyze the operation of the junctions on the railroads of Siberia and the Far East, particularly on the route Mezhdurechensk--Abakan--Tayshet. Emergency measures are required to normalize the train situation. This is the main condition for providing the Kuznetsk Basin with empty cars and for prompt coal loading.

The efficient use of scarce rolling stock is also sharply reduced by the slow loading at the underground and strip mines, and this has not only not been accelerating, but at a number of them has declined with a rise in coal output. Thus, at the Zyryanovskaya mine of the Yuzhkuzbassugol' [Southern Kuznetsk Basin Coal] Association there were three loading points with a total productivity of 770 tons an hour. At present only one remains loading 500 tons an hour.

At the Chernigovskiy mine they built an enrichment unit which improved coal quality. However there were no storage facilities here, and as a result the car stoppages have risen from 1.3 hour up to 13 hours.

Today, coal workers can load a car in 10-30 minutes. Therefore, with intensive delivery of empty cars, they cannot handle them quickly and will refuse delivery.

The railroad workers of the Kemerovo Railroad at present are introducing a whole series of measures aimed at accelerating the movement of the cars, their processing and loading in order to make up for the failings, and to replenish the winter stocks at the power plants and industrial enterprises. For this they need the help of the MPS and the collectives of the adjacent railroads.

10272
CSO: 1829

RAILROAD

FIGURES FOR INCREASED TRAIN WEIGHTS GIVEN

Moscow GUDOK in Russian 5 Sep 80 p 2

[Article: "Trains with Increased Weight: Three Resources"; passages enclosed in slantlines printed in boldface]

[Text] Warmly supporting the initiative taken by the collective of the capital's mainline to increase the weight and length of freight trains, railroad workers of many mainlines are utilizing this experience creatively and have achieved satisfactory results. While train weight was increased an average 7 to 20 tons during the first years of the 10th Five-Year Plan, it was increased during the first half of this year by 92 tons on the Transbaykal Railroad, 61 tons on the West Kazakhstan Railroad, 52 tons on the East Siberian Railroad, 51 tons on the Krasnoyarsk Railroad, 47 tons on the West Siberian Railroad, 46 tons on the Lvov Railroad, and 38 tons on the North Caucasus Railroad.

However, even with such rates of increase in train weight, the tractive force of electric and diesel locomotives is still far from being utilized to the full extent. Last year, for example, the useful work per unit of capacity in the locomotive fleet amounted to 18.5 million gross ton-kilometers less than in 1970. Such a situation attests to the vast unutilized potentials for increasing train weights, which makes it possible to increase the capacity of sections, reduces operating expenses and the net cost of transportation, and influences many other technical and economic indicators in rail transport operation.

What are the resources which have not been fully utilized to bring about a more significant increase in average train weight without delay and without additional material and manpower outlays?

To begin with, trains which are not completely loaded and those which do not have the full number of cars can be discontinued. At present, more than 620 unit trains that are of insufficient weight and about 530 unit trains that do not have the full number of cars, in which over 210 tons of freight are not being carried, pass through technical stations [tekhnicheskiye stantsii] every day. During the years of the 10th

Five-Year Plan, there has been 4.5 times more insufficiently loaded rolling stock on the Dnepr Railroad, four times more on the Far Eastern Railroad, 3.7 times more on the Azerbaijan Railroad, 2.9. times more on the Central Asian Railroad, 2.8 times more on the October Railroad, and 1.8 times more on the Northern Railroad. These and certain other railroads are turning trains over to their neighbors which are incomplete in load and length. On the Northern Railroad, for example, 3.9 times more incompletely loaded trains and 4.2 times more trains without the full number of cars were dispatched from stations in June, compared with the same month in 1975.

/Elimination of those trains which are of insufficient weight and those which do not have the full number of cars will make it possible not only to increase the weight of a freight train (not less than by 9 tons for the network as a whole), but will cut back the dispatch of 150 trains daily from stations and will economize 60 locomotives as well./

A second and no less important resource for further increasing average train weight is more complete utilization of railway cars' freight capacity. Under present conditions, increasing a car's load by just a ton increases the average weight of the train by 50 tons and reduces transport costs by nearly 2 percent.

/In the first 6 months, the static load of a car increased by 0.8 percent compared with the corresponding period last year. This has made it possible to increase the average net weight of a freight train by 22.5 tons./ Highest increases in static loading compared with last year were achieved as follows: West Kazakhstan Railroad by 3 percent, Southwestern Railroad by 3 percent, Lvov Railroad by 2.4 percent, Odessa Railroad by 2.3 percent, Central Asian and Far Eastern Railroads by 2.2 percent, and the East Siberian Railroad by 2 percent. But the target for static loading in the first 6 months was not met by the Gorkiy, Virgin Lands, Sverdlovsk, South Urals, West Siberian and Kemerovo Railroads.

And the explanation for this is simple. The Sverdlovsk and South Urals Railroads load a gondola with 1.6 to 2.5 tons of fluxes less than on the North Caucasus and Donetsk Railroads. The same Sverdlovsk Railroad loads 12.0 tons less peat in gondolas than the Belorussian Railroad. In transporting iron ore, the South Urals Railroad loses a half ton by underloading, compared with the Dnepr Railroad, on each gondola. Moreover, the transport of containers in gondolas is permitted on certain railroads.

A third and no less important resource for increasing average train weight is a decrease in the unproductive empty runs of railway cars. At present, nearly every fourth car is being moved when empty. But every third car is empty on the October, Northern, North Caucasus, Azerbaijan, Virgin Lands, Alma-Ata, Central Asian and Far Eastern Railroads.

During the years of the 10th Five-Year Plan, empty runs by cars have increased by 2.6 percent. The highest increase was on the Gorkiy and Sverdlovsk Railroads--by 5.6 percent, in view of the change in the direction of movement of empty gondolas to the Kuznetsk Basin. This also applied to all railroads of the central and northwestern regions, as well as the Southwestern, Lvov and Dnepr Railroads, inasmuch as utilization of gondolas for the shipment of associated planned freight has been sharply reduced.

Many railroads, having appreciably reduced the shipment of associated freight, have increased the number of empty gondolas turned over.

In July, for example, the Dnepr Railroad underfulfilled the plan for the shipment of freight bound for the Southern Railroad by more than 3,000 gondolas, for the Donetsk Railroad by 2,000 gondolas, for the Odessa Railroad by 4,500 gondolas, and for the Lvov Railroad by 9,000 gondolas. But the regulated quota for turning over empty rolling stock was fulfilled nearly every day. The Belorussian Railroad underloaded for the Northern, Donetsk and Virgin Lands Railroads, and at the same time turned over 291 empty gondolas under a norm of 280. The Gorkiy Railroad underloaded more than 3,000 gondolas bound for the Northern Railroad, about 2,000 for the Southern Railroad, and 1,000 for the Kemerovo Railroad, but then it turned over 108 empty units more than specified every day.

To a certain extent, the increased number of empty cars turned over is accounted for by the existing bonus system. The management of railroads receives a bonus for turning over empty gondolas, regardless of the extent to which the plan for shipment in through service has been fulfilled. Results of work in July indicate that not one of the railroads being supplied with empty cars received the number of loaded gondolas stipulated by the plan. About 100,000 loaded gondolas were not forwarded to 10 railroads. This has led to a reduction of no less than 3.5 tons in average train weight. /But reducing the empty runs of cars by 1 percent makes it possible to increase average train weight in the network as a whole by 8 tons./

5938
CSO: 1829

RAILROAD

NON-RUSSIAN WORKERS CONSTRUCT BAM CITIES, SETTLEMENTS

Moscow GUDOK in Russian 4 Sep 80 p 4

[Interview between Correspondent A. Skorobogatov and Yuriy Sergeyevich Sushkov, head of the Department of Building and Architectural Affairs, Gosstroy RSFSR: "BAM: Towns and Settlements Are Growing"]

> [Text] Before us is a diagram of the Baykal-Amur Mainline. The winding ribbon of its route is color-coded with small white and red circles. The red ones are larger. There are particularly many of them beyond Lake Baykal, and further on to the east, where the Little BAM line takes off to the north from Tynda.

[Question] What do these colors mean?

[Answer] Stations at which taiga settlements and towns are growing are designated by red ones--answered the Head of the Department of Building and Architectural Affairs, Gosstroy RSFSR Yuriy Sergeyevich Sushkov. There will be about 60 of them in all. For now some of them exist in design sketches, while others have already begun to take shape. Residential, service and public buildings are being erected with the assistance of project and building organizations from all 15 union republics of the motherland, and from the 30 autonomous republics, krays and oblasts as well. For example, on just the sector of BAM in Irkutskaya Oblast, chiefs from Krasnodarskiy and Stavropol'skiy Krays are erecting a railroad settlement at the Lena station. Envoys from Armenia are working in Tayura, in Niya [spelling unverified], housing and service-technical buildings are being created from a plan by Georgian architects. In Kiringa [spelling unverified], the same problem is being solved by architects from the Kabardino-Balkarskaya ASSR and "Rostovgrazhdanproyekt," in Ul'kan, from the Azerbaijanskaya SSR, in Kunerma, from North Osetiya, Dagestan and Checheno-Ingushetiya. Builders from Gor'kovskaya, Sverdlovskaya and Moskovskaya Oblasts are developing Central Sector settlements at the stations of Mogot, Kuvykta, Khorogochi and Dipkun. A monument to the hero of the Civil War in the Far East, the legendary

Sergey Lazo, has already been put up in the station square in the settlement of Alonka [spelling unverified], which is being built by envoys from Moldaviya.

Muscovite architects and builders are supervising Tynda, the capital of the BAM. They are transforming this previously obscure place into a modern city with a population of many thousands. The buildings here are a match for those in Moscow, both in beauty and convenience.

[Question] And what other kinds of cities will spring up on the route of the new trans-Siberian line?

[Answer] It is planned that the city of Neryungri will become the largest population center of this region. Its population will exceed 100,000 persons in the future. In time Severobaykal'sk will achieve city status. Development of copper deposits in the region of the future station of Chara will be the start of construction on the city of Udakan. It is possible that the settlement near the station of Taksimo will become a city of 25,000.

[Question] Knowledge of each population center situated on a railroad line usually begins with the terminal. What kind will they be on the BAM?

[Answer] We still have to build 58 passenger buildings on the route. It was decided to erect 10 of these, for Tynda, Severobaykal'sk, Urgal and other major junction points based on individual projects, and the rest based on projects drawn up on the basis of standard ones. The largest terminal on the route will spring up in Tynda. A monumental building has been designed by architects from Architecture Shop No 8 of "Mosproyekt-1." Two pylons similar to towers, reaching a height of 40 metres will embellish it from the track side. Accommodations for the dispatcher point will be built between the two pylons, from whence control of the electrical interlocking of switching and signal devices is to be organized. There are to be two passenger halls in the central part of the building under a single roof. The first, a waiting room, is laid out as an amphitheatre over an operations room. A cafe, rooms for mothers with children, a hotel for passengers in transit and shops for personal services [Russian--atel'ye sluzhby byta] will be opened in adjacent rooms.

As for the terminals at the stations on the line, they will be relatively small two-story buildings. Twenty-seven of them are designed for 50 passengers, and the rest for 25. The ground floor is for passengers: electrical interlocking posts, automatic telephone stations and other technical accommodations will occupy the second.

In order to insure architectural unity of the passenger buildings, it is planned to use decorative details when finishing the façades. The walls will be decorated with national ornaments as well as monumental art works.

[Question] What kind of conveniences will there be for the settlement residents?

[Answer] The project for the settlement of Fed'kin Klyuch, which has been approved by Gosstroy RSFSR, may serve as an example. By recommendation of architects from "Mosgiprotrans" [Moscow State Planning and Survey Institute of the RSFSR Ministry of Transport Construction], its central part will be developed with panel-type two-story buildings. Small plots of ground will be set aside next to them for growing vegetables in enclosed ground. Outdoor structures for domestic livestock and fowl are specified. It has been planned to develop a part of the settlement with farm-type houses: wooden cottages with apartments on two levels. A school, stadium and zones for mass recreation will be opened in the settlement.

9194
CSO: 1829

RAILROAD

NEW ELECTRIC LOCOMOTIVES FOR BAM BUILT AT NOVOCHERKASSK

Moscow GUDOK in Russian 18 Sep 80 p 1

[Photo caption]

[Text]

The Novocherkassk Electric Locomotive Plant is the leader in domestic electric locomotive manufacture. Locomotives bearing its trademark are in operation on a majority of the country's electrified lines. The new VL84 electric locomotive recently emerged from the plant's shops. This powerful workhorse will lead trains on the Baykal-Amur Mainline. It now is undergoing tests on the Bataysk-Ilovaysk section. VL80S series-produced alternating current electric locomotives with rheostat braking, operating in a multiple units system, depart the plant's gates regularly for the steel mainlines. In 1980, the state Seal of Quality was awarded to this new modification. R. Ivanov's photo shows a new electric locomotive at the plant's gates.

7869
CSO: 1829

RAILROAD

CONCRETE CROSS TIES PRODUCED AT KOROSTEN'

Kiev PRAVDA UKRAINY in Russian 24 Aug 80 p 1

[Article by RATAU correspondent A. Yanushevskiy: "To Transportation Construction Sites"]

[Text] The Korosten' Reinforced Concrete Cross Tie Plant has begun to manufacture longer-lasting components for building new and reconstructing old rail lines. The first consignments of such products have been dispatched to transportation construction sites. Their use will make it possible to improve the technical state of the steel mainlines, reduce expenditures to maintain them, and shift to higher speeds. Next year mass production of improved cross ties will begin.

Technical upgrading of the enterprise now is underway at full speed. New, standardized industrial lines supplied by Hungarian enterprises have gone into operation. Mechanized complexes dispense the concrete, shape the product, place them in stacks, then bale and load them into cars. An additional two such lines now are in the process of being installed.

The plant provides cross ties to many transportation construction sites in the Russian Federation, the Ukraine, Belorussia, and Moldavia. Reconstruction of mainlines leading from Moscow to Kiev, Leningrad, Minsk, and Voronezh has been accomplished with participation of the enterprise's collective. Having taken up the labor watch in honor of the 26th CPSU Congress, the collective strives ahead of time to fulfill orders from underway construction projects this year. Tens of thousands of reinforced concrete cross ties manufactured ahead of schedule already have been dispatched for construction of sidings at metallurgical construction sites.

7869
CSO: 1829

RAILROAD

ER-200 TO BEGIN REGULAR COMMERCIAL SERVICE

Moscow PRAVDA in Russian 24 Aug 80 p 1

[Article by V. Petrov, correspondent for the large newspaper OKTYABR'SKAYA MAGISTRAL': "The ER-200 Departs For Moscow"]

[Excerpts] But, before us was a train, after all! The ER-200, capable of speeds up to 200 kilometers per hour, is the fastest train in our country. It was created at the Riga Rail Car Plant in cooperation with enterprises and organizations in the Ministry of Railways.

Its operational tests on various routes of the October Railroad lasted about 5 years. As a result, the electric train travelled more than 100,000 kilometers. During this period, tractive and power components, automatic devices and brake systems, the cars' qualitites of durability, and the reliability of their couplers were tested exhaustively. Three round trips with passengers to Moscow were made last fall. And now, having carefully studied the results of all tests, an expert commission gave the "OK" for regular commercial ER-200 service.

On Sunday, the fast electric train will pick up its passengers and depart with them for the city on the Neva. And, beginning 5 September, it will travel regularly to the capital Fridays and return to Leningrad Saturdays.

7869
CSO: 1829

RAILROADS

FINNISH PRESS: FINLAND MAY HELP BUILD TRAIN FACILITY

Helsinki UUSI SUOMI in Finnish 26 Aug 80 p 7

[Article: "Will Finland Build a New Repair Station for Soviet Railroad Cars?"]

[Text] According to Transportation Minister Veikko Saarto, Finns will build a new repair station for railroad cars near Leningrad. The offer for such work was made by Nikolai Patolitchev during his visit to Finland a couple of months ago.

The need for a repair station located near Finland is great, because a lack of Soviet railroad cars is seriously delaying goods traffic for trade with the East on Finnish railroads.

Formerly Viipuri was considered as a location for the repair station, but according to information now received by Minister Saarto the station will be built somewhere around Leningrad.

The value of the construction job according to Saarto would be about 60 million marks. It is intended to repair about 500 cars a day there. Each year about 600 freight cars would be overhauled thoroughly.

Also Lappeenranta is desirous of obtaining repair work on Soviet cars for itself. The Lappeenranta city council made an official proposal on Monday of last week for placing another ship in the area of either Vainikkala or Raippo-Simola.

9611
CSO: 3107

RAILROAD

BRIEFS

RAILROAD SWITCHING EQUIPMENT--Much has been changed over the years of the 10th Five-Year Plan at the railroad's freight stations. Most of them are efficiently introducing new equipment and advanced technology. So workers who make up the trains are successfully utilizing the "Dnepr" radio station to speed up train classification. About 90 percent of the switches at the railroad's stations have been electrically centralized. This has made it possible to release hundreds of workers who are working in other sections. The stations of Kerch', Shmakovo, Vecherniy Kut and Zheltyye Vody-2 are now introducing such equipment. In four and a half years of the five-year plan, about 1,000 technical innovations with an economic gain of over 4.5 million rubles have been introduced on the mainline. [Text] [Moscow GUDOK in Russian 5 Sep 80 p 4] 8936

RAILWAY WORKERS' AWARD--A. Ponomarenko, train classifier at the Nizhnedneprovsk-Uzel station, and N. Kobenko, electrician in the Zaporozhskaya railway division for signals and communications, have been awarded the Honorary Certificate of the Komsomol Central Committee for high indicators in socialist competition. The young workers are true experts in their work. The former made up 240 heavy trains, in which an additional 14,000 tons of national economic freight was carried, in 6 months. N. Kobenko has fulfilled his socialist pledges for the current year. The leading Komsomols have been warmly congratulated on their high award by their colleagues. [Text] [Moscow GUDOK in Russian 5 Sep 80 p 4] 8936

CSO: 1829

OCEAN AND RIVER

NOVOROSSIYSK BULK PLANT REBUILT, DEEPWATER MOORAGE ADDED

Moscow NEFTYANIK in Russian No 8, 1980 pp 30-31

[Article by L. Stepanets and A. Khomenko of the bulk plant "Sheskaris" entitled:"Bulk Plant Prepared to Receive Large-Tonnage Tankers"]

[Text] In recent years, the use of large-tonnage tankers for the transport of petroleum and petroleum products has become more and more widespread. In this connection, at the marine oil-storage terminal "Sheskharis" (in Novorossiysk), a deepwater pier for the loading of 80-250 thousand ton deadweight tankers has been reconstructed and improved.

To fulfill international standards for loading, to assure safety, and to prevent accidents or the pollution of the environment, the bulk plant was fitted out with the most modern production equipment and with automatic control of the production process.

The deepwater petroleum pier consists of pipelines for delivery of petroleum and petroleum products and for the acceptance of ballast, and equipment for connecting the pipelines of the tanker with shore pipelines.

The tankers are connected to shore pipelines by pivoted, counterbalanced, RCMA [expansion unknown] marine flexible pipes for filling or discharging. There are four, 406.4 millimeter, RCMA filling or discharging stands,each with a capacity of 5,000 tons per hour on the petroleum delivery pipelines. The handling of dark petroleum products is carried out with two RCMA filling or discharging stands of 305 millimeter diameter with a capacity of about 2000 tons per hour. The filling or discharging stands are connected to the receptor flanges on the tanker by hydromechanical couplings. Automatic equipment permits following any ship movements within the working zone.

Remote control of the filling or discharging stands is accomplished with a handy, moveable console, or, in some cases, by a cable from a carried-out or stationary console.

Assemblies for regulating the pressure in the main petroleum pipeline and the flow rate at the filling or discharging stands are included in the automatic flow rate control system. Automatic analyzers installed in the flow permit continuous monitoring of the qualitative characteristics of a product being handled. Analysis of petroleum is done according to five parameters: temperature, water content, chloride salts, and sulphur. Petroleum products are analyzed only for temperature and density. The indicated analyses are processed in an EVM [computer] and at the end of transfer, their mean value is printed out.

Registration of the quantity of transferred product is done with counting flowmeters. For the petroleum lines, turbine flowmeters are used and for petroleum products - rotor flowmeters. The flowmeters are verified by monitoring installations on the pier. In its turn, a turbo-piston device, TPU-4000, with a capacity of 4000 tons per hour provides a check of all flowmeters. The accuracy of registration of transferred products is ± 0.25%.

The assembly and processing of information about the process of transfer and the calculation of specific loadings is done by an automated process control system (ASUTP).

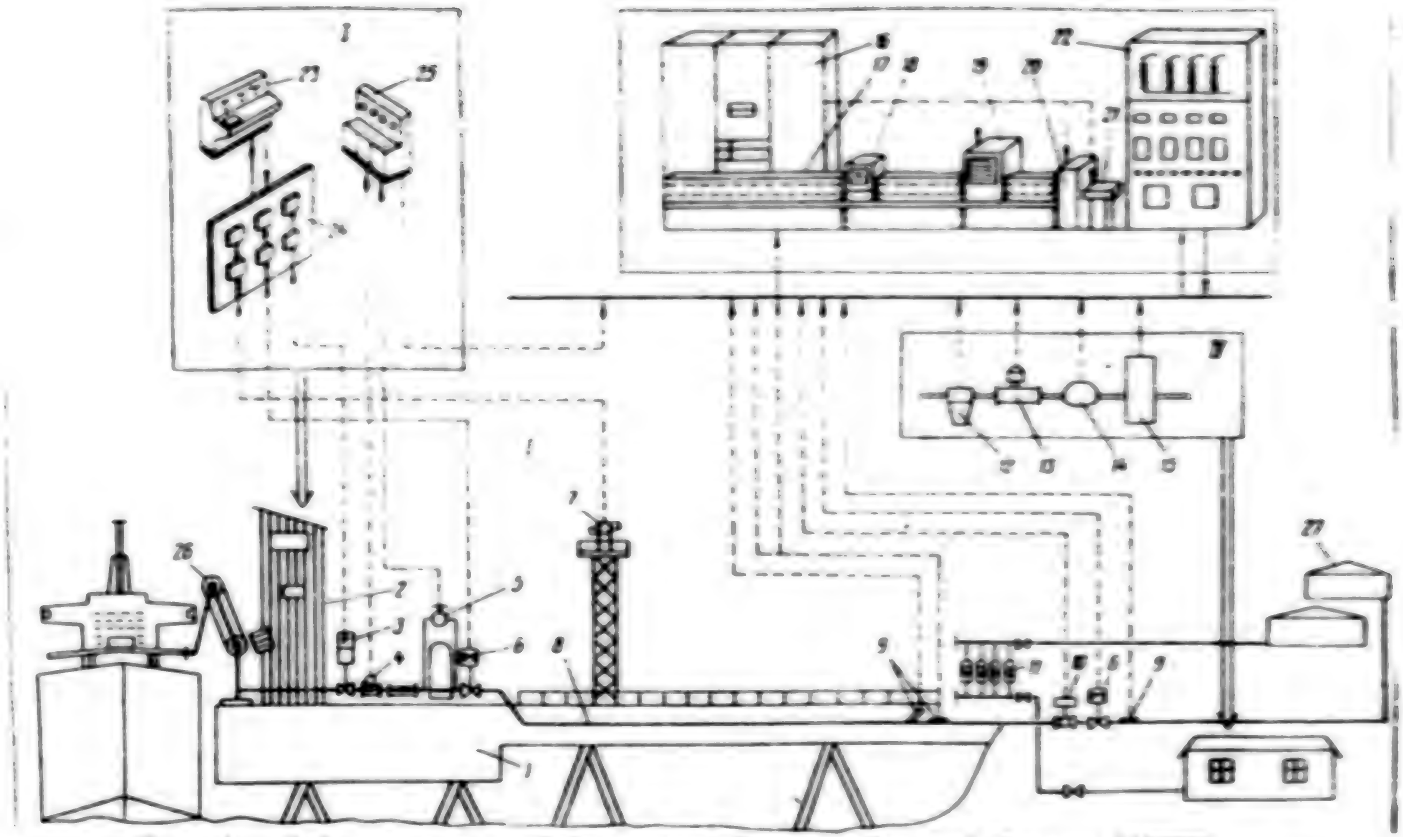
At the "Sheskaris" bulk plant, the ASUTP for the loading of petroleum and petroleum products embraces the deepwater pier and six other piers and a complex of on-shore structures serving the operation of the equipment on the piers. The functional arrangement of the ASUTP is shown in the illustration.

The bulk plant ASUTP is regarded as an information and advisory system. The assemblage of system hardware and software automatically assembles information about the progress of a production process and allows the processing of it by means of a KIPiA [expansion unknown] or by computer equipment. It is used to monitor a production process according to set-in values, to regulate automatically the delivery rate and volume of product being transferred at each filling or discharging stand, and to obtain operational, budgetary, and accounting reports.

Sensors and signalling devices installed in the equipment are the sources of information about the condition of the equipment and the progress of a production process. Final processing, storage, and output of information is done by a mini-EVM [mini-computer].

The software allows the EVM to operate in a multiprogram mode that makes it possible to monitor the status of a production process, to give out information according to questions of the operator, and to carry out adjustment of programs in a time-sharing mode with allowance made for the priority of working programs. Mini-EVM processing of information includes distribution of incoming data according to tables and files (the ordered composition of the data is on an external carrier), the calculation of the mean values of the parameters of products being transferred, and comparison of incoming data with settings.

The output of information is produced as requested by the operator (accounts, reports, a log of the transmittal of a change), or on a time basis (daily, monthly, yearly reports) and also at the beginning of an emergency situation or at the completion of a production operation (notice). The information is put out in alpha-numeric form and in binary code on perforated tape.



Functional Arrangement of Automated Process Control System (ASUTP

I-production equipment, II-local control center, III-central control center, IV-analyzer unit

1-production platform, 2-control hut, 3-pneumatically operated flow-rate control valve, 4-flowmeter 5-filter obstruction sensor, 6-electrically operated gate valve, 7-television camera, 8-petroleum pipeline, 9-temperature and pressure sensors, 10-hydraulically operated pressure regulating valve 11-valves for hydraulic shock protection, 12-density meter, 13-moisture gage, 14-petroleum sulphur content indicator, 15-petroleum salt content indicator, 16-mini-computer, 17-production process control console, 18-television monitor, 19-color display, 20-line printer, 21-small printer, 22-instrument panel, 23-local pier-control console, 24-automation unit, 25-local control panel 26-filling or discharging stand, 27-storage tank field.

The operator accepts the solution on the basis of information collected and processed by the system. As standard comparative information, the operator uses instructions and data feeding into the EVM system from a higher computer center.

Controlling commands are produced by the control and communications equipment. The control equipments are the consoles and panels with the starting and regulating apparatus. Monitoring for the execution of a command and the working of the controls is accomplished with the aid of the subsystem for assembly of information.

Auxiliary devices of the ASUTP assure the normal operation of the assemblage of equipment in the supply subsystem.

Among the devices of the subsystem are the sources (including emergency sources) supplying electrical current to the devices of the central control station, the air compressors supplying compressed air to the KIPiA, and the air conditioners. Information about their operation is included in the total flow of data about the operation of the systems.

The reconstruction and the introduction of automated controls of the production process improved working conditions for personnel of the "Sheskaris" bulk plant, and reduced the danger of polluting the environment. In addition the system turned out to be effective economically. The annual profits, only since placing the deepwater pier in operation, amount to about 10 million rubles. That allows repayment of the capital investment in less than two years.

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9136
CSO: 1829

OCEAN AND RIVER

LARGE STORAGE PORT TO BE BUILT IN PODPOROZHSKIY RAYON

Moscow PRAVDA in Russian 29 Aug 80 p. 6

[Article by Pravda Correspondent G. Petrov entitled; "There Will Be A Port on the Svir"]

[Text] In the Podporozhskiy rayon of the Leningrad oblast, near the village of Vazhin, a large development soon will be unfolded. A transshipment port will be built here - one of the largest in the northwest.

This project was developed at the Lengiprorechtrans institute [Leningrad State Institute for Planning River Transportation] with the participation of the Lengiprotrans and Lengrazhdanproyekt institutes [Leningrad State Institute for Planning Transportation and Leningrad Institute of Civic Planning]

The basic purpose of the port of "Vazhiny" is to provide for the transshipment of coal and chemical raw materials for the Leningrad and Novgorod oblasts, and also for the transshipment of timber which will be forwarded into Finland along the Saymenskiy canal. This shifts a substantial volume of cargoes from the railways onto waterways. In addition, the deepwater piers of maritime commercial ports in Leningrad and Vyborg will be freed of the unloading of river ships. And these ships will not lose time awaiting the raising of Leningrad bridges. The use of the fleet will thereby be improved, and the passage capacity of the Neva will be increased.

The location of the port will put an end to passages by empty ships in river transport. Crushed stone, coal, and other materials necessary for construction in Leningrad, Moscow, and other cities will be loaded on to river transport right there.

"What will be at the port of 'Vazhiny' ?"

The chief engineer of the project, L. I. Polyashkov, tells about this.

"It is intended to build four piers having a total length of 640 meters with full mechanization of loading and unloading operations. A set of buildings and utility systems, a fleet servicing base, a railroad branch line, and motor transport approach roads will be built.

We have paid great attention to preservation of the environment. A separate pier is specified for the usual ship wastes. Also specified is equipment to prevent the formation of dust in loading coal, and equipment for the purification of the domestic and industrial water from all facilities of the port.

Even rain and snow runoff will be cleaned for subsequent use in the dust suppressing system."

"For us, the rivermen, the creation of the port of'Vazhiny' has great importance" says the deputy chief for ports and capital construction of the North-Western river shipping company, V. V. Ivanov. "This powerful modern enterprise will serve the development of river transport. Its advent will have a notable effect on life in the Podporozhskiy rayon".

9136
CSO: 1829

OCEAN AND RIVER

NEW REFRIGERATOR SHIP FOR LATVIAN FLEET

Riga SOVETSKAYA LATVIYA in Russian 27 Jun 80 p 2

[Article entitled: "Fleet for All Latitudes"]

[Text] Into the port of registry of Riga has come a new ship bearing the name of the outstanding Soviet physicist, Academician Rema Viktorovich Khokhlov (1926-1977).

The "Akademik Khokhlov" is the first refrigerator ship of a new series reinforcing the fleet of the Latvian shipping company this year. This general-purpose ship is for the transport of fruit, meats, fish, and fats. Automatic systems maintain the holds at the temperature necessary for the preservation of the cargo. The motorship will operate on transoceanic lines connecting states in South America with Soviet ports.

"In the Tenth Five-year Plan alone, the number of ships registered in Riga and Ventspils has grown almost by a factor of two." V. Dyrchenko, chief of the Latvian shipping company told the correspodent of LATINFORM [Latvian News Agency?]. "We now have fast tankers, roll-on-roll-off ships, and gas carriers. Fruit carriers make up one fourth of our fleet. They make passages to more than thirty countries. Many foreign countries regularly charter these convenient, fast, comfortable ships. By the end of this year we will receive one more motorship of the same type, built at Polish shipyards - the"Akademik Artobolevskiy".

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OCEAN AND RIVER

BRIEFS

CHANGING THE MAKEUP OF THE PIERS--- Odessa, 16 Aug.--- Almost 200 years ago the first piles were driven for the piers of the port of Odessa. Today the constructors have again come here. Reconstruction of the Karantino mole has begun. One of the best piers in the Black Sea, and a post for regulating ship movements are being set up. To increase the throughput capacity of the port, the management structure and organization of labor have been improved. Special piers, warehouses, and transshipment complexes are being built, and the brigade of longshoremen is being enlarged. The innovations have permitted raising the level of cargo processing, in comparison with previous years, by more than one half a million tons. [Text] [Moscow PRAVDA in Russian 17 Aug 80 p 2] 9136

TRACTOR-CONTAINER CARRIER--- Vladivostok--- A ship for carrying tractors with container-trailers helps to solve the problem of unloading large-size cargoes on a shore without landing facilities. It was developed by Far Eastern designers. The novel ship will permit initiation of progressive container transport to the most remote points of the Pacific Ocean and Arctic coasts. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Aug 80 p 2] 9136

USING EXPERIENCE--- Kerch', Krymskaya oblast' --- The tanker fleet has been reinforced with a series of supertankers. On the workers' holidays, the "Zaliv" shipyard imeni B. Ye. Butoma turned over to seamen the last ship of this type - the "Sovetskaya Neft'." It has a 150,000 ton deadweight. The shipbuilders are using experience in the building of supertankers in the construction of a new series of large petroleum tankers of the "Pobeda" type. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Aug 80 p 2] 9136

ARCTIC OPERATION COMPLETED--- A complex operation in the Arctic has been completed. The nuclear icebreaker "Lenin" conducted the motorship "Stakhanovets Yermolenko" through the thick ice barriers of the Kara Gateway into the clear waters of the Ob' inlet. On board the ship are two fractionating towers for the Tobolsk petrochemical combine. The structures, almost one hundred meters long, are being transported in assembled form in order to allow Siberian workers to put this equipment into operation at an earlier date. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 32 Aug 80 p 2] 9136

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DETERMINING EFFECTIVENESS OF CAPITAL INVESTMENT IN TRANSPORT

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 7, 1980 pp 60-64

[Article by Doctor of Technical Sciences and Professor A. Ye. Gibshman and Doctor of Economic Sciences and Professor V. N. Livshits: "Need for a General Transport Method of Determining Capital Investment Effectiveness"]

[Excerpt] Over the long term, capital investments in developing all types of transport will be in the hundreds of billions of rubles. The most appropriate use of these resources will depend largely on improvement in the methods of determining the economic effectiveness of capital investments in the country's transport system, and especially in rail transport, which will retain its leading position in the long term.

It is known that the basic provisions on determining the economic effectiveness of capital investments have been drawn up in the Standard Methods, approved in 1969. Branch instructions, including ones by type of transport, have been worked out, approved and agreed to by the USSR Gosplan for calculating capital investment effectiveness.

Subsequently, in addition to the Standard Methods, specialized methods, mandatory for the entire national economy, which regulate optimization calculations for individual measures and types of work were put into effect. Thus, "Basic Provisions for Determining the Economic Effectiveness of Using New Equipment, Inventions and Efficiency Proposals in the National Economy" were approved in 1977, and "Methods of Determining the Economic Effectiveness of Automated Control Systems for Enterprises and Production Associations" were approved in 1978; "Standard Methods of Calculations to Optimize the Long-Range Development and Distribution of Production" were worked out in 1977. Based on these and other methods, we worked out branch methods instructions, including ones by type of transport. In particular, instructions on calculating the effectiveness of new equipment were put into effect in rail transport.

Along with methods instructions based on corresponding unionwide specialized methods for individual branches of the economy, including rail transport, there are in effect methods instructions based on the 1969 Standard Methods and branch scientific research. In rail transport, such normative documents include "Methods Instructions for Comparing Planning Resolution Variants for Railroad Lines, Junctions and Stations" (1973), "Methods Instructions for Determining the Economic Effectiveness of Building New Railroads" (1977) and a number of others. All the branch methods instructions cite normative and reference data and give examples of the most typical or most complex calculations. Transport optimizational calculations, along with official, tested instructions, make extensive use of unofficial practical recommendations and conclusions from individual scientific research.

The presence of such documents to regulate the methods of calculating economic effectiveness in transport testifies to the complexity of the calculations necessitated by the recording of important features of transport, both in the sphere of material production and as an object of capital investment. For example, planning, the needed economic substantiation and the creation and operation of transport facilities extends over 4-5 or more years, and an equal amount of time is required to develop them as well. In this regard, the capacity of many facilities must be determined for a long-term period of at least 10 years. As a result, for complex construction projects being planned in 1979-1980 we need to take into account with some degree of probability conditions in a more long-range perspective, bearing in mind that the operation of a majority of the transport facilities is not limited by these time periods.

A significant portion of the capital investments is directed into the transport infrastructure, its permanent installations. As a rule, the capacity of these installations must grow systematically in accordance with the increase in the amount of shipment, but capacities can grow only in stages, with the periodic creation of reserves which are then gradually utilized. The immobility of locally situated transport output reserves and the impossibility of accumulating them complicate optimizing the sequence in which the amounts by which capacities can be increased, and the duration of the calculation period obligates us to take the time factor into account in capital investments and in the depreciation of fixed assets.

The fact that the availability of equipment to transport facilities must be increased in stages and the complex, uneven character, in terms of time, of the change in the load on that equipment during the course of each stage lead to complications in the function of operating expenses to amount of shipment done and to mandatory consideration of the time factor in them, just as in capital investments.

The fact that transport lacks its own raw material and the associated high level of labor-intensiveness of transport output demands, given limited labor resources, consideration of the effectiveness with which these resources are used from the perspectives of the entire national economy.

The close interaction between transport and other branches of the national economy and the interchangeability of the various types of transport make necessary a broad, national-economic approach to solving a majority of the transport problems with consideration of the transport and extra-transport impact. The task is complicated by the great social importance of transport, by its effect on the environment, and also by its participation in foreign economic ties and the necessity in these instances of considering currency effectiveness.

The necessity of analyzing the long-range dynamics of transport development and its operation make it impossible to predict precisely and unambiguously the operating conditions of the transport system as a whole and individual elements in it, of many technical-economic parameters of their installation, operation and development. An evaluation of the effectiveness of resources use in transport therefore requires consideration of the incompleteness and imprecision of the data being used.

In accordance with the transport features examined above, we can analyze the most characteristic shortcomings of the existing methods normative base and find ways of eliminating them. In our view, one portion of these shortcomings can be eliminated by refining the principles of evaluating the effectiveness of capital investments in transport which are used in the branch methods; elimination of another is associated primarily with the range of factors taken into account when evaluating effectiveness. This work must be done in a coordinated manner for all types of transport, since the listed features are general ones and must be taken into account when evaluating the development of the transport system, and in particular when resolving tasks dealing with the interests of several types of transport, when the conditions of methods compatibility of the principles and comparability of the expenditures and effects being taken into account are obligatory.

In our opinion, in order to create a better base for calculating the effectiveness of capital investments in transport, a number of important shortcomings in the existing branch recommendations must be eliminated, such as, in particular, the instructions' requirement (including those for rail transport) that, when comparing new equipment variants, one must add to capital investments in new equipment the undepreciated portion of the old assets if they cannot be used in putting the new equipment into operation. In spite of the fact that this requirement is linked to cost-accounting practices, when old undepreciated assets are not written off, depreciation deductions are made for them and established payments for funds are levied, it can result in the selection of by no means the best resolutions from a national economic point of view. It is important to remember that the actual expenditures of the national economy are capital investments in developing the transport and rolling stock infrastructure and that the actual impact is the difference in current expenditures and depreciation deductions between the old and new equipment on up-dating and overhauling. So the new equipment variant should not deduct funds for up-dating and overhauling old assets; another thing is that the enterprise at which the new equipment will be introduced can compute the losses if the write-off of unused assets is delayed and depreciation deductions are made for them for a certain time and the payment levied. It has repeatedly been proposed recently that the sector of the Moscow-Leningrad line near Vereb'ye Station be straightened. As compared with the existing route, the radii of the curves and the length of the track would be reduced by 5 km. Additional capital investments in restructuring would be recompensed in 4-5 years if one does not take into account in their cost the old by-pass and depreciation deductions for it in the operating expenses for the new route, that is, the measure is quite effective. If, however, one adds to capital investments on straightening the route the cost of the old assets, an incorrect conclusion is reached that it is inappropriate to straighten the route, since the residual value of the by-pass is great and exceeds the cost of the entire new route. At the same time, neither expenditures on the new route nor operating expenses after it is put into operation depend at all on the residual value of the old route, much less on the cost of maintaining it. Therefore, these components should not be added to expenditures on the new route.

Let us note that the Methods for Determining the Economic Effectiveness of New Equipment which were approved in 1977 do not indicate the necessity of adding to capital investments on its start-up the undepreciated value of old equipment.

Let's examine an example of recording renovation deductions. Given expanded reproduction, the proportion of renovation deductions ρ depends not only on the service life t_{sl}, but also on the calculation normative E_{cn} which takes into account the economic unevenness of expenditures made at different times. Until it becomes necessary to renovate particular facilities, the funds deducted for these purposes are used in the national economy and provide an impact at at least the normative level. In view of this fact, and as a number of works have demonstrated, the proportion of renovation deductions equals

$$\rho = \frac{(1-\alpha)\, E_{cn}}{(1+E_{cn})^{t_{sl}} - 1},$$

where α is the proportion of liquid value of the facility.

It should be noted that, given the change-over to the new system of recording renovation deductions in optimization calculations for complex projects combining an aggregate of units with different service lives (new lines, second tracks, electrification of railroads and others), their reference values ρ can be set as weighted averages for the various elements comprising them.

Initial data	renovation quotas for t_{sl} years					
	3	5	10	15	20	25
value ρ calculated as $1/t_{sl}$	0.333	0.200	0.100	0.066	0.050	0.040
using the formula: given E_{cn} = 0.08	0.308	0.170	0.069	0.037	0.022	0.014
> E_{cn} = 0.10	0.302	0.164	0.063	0.031	0.018	0.010

The table gives values ρ, given ($A = 0$), calculated from the formula and using the usual norm, accepted as equalling the reciprocal of the service life. Given a facility service life of five years, for example, and $E_{cn}=0.08$, renovation deductions being used effectively in the national economy are at least $0.170 \cdot 1.08^4$ when deducted at the end of the first year of service, $0.170 \cdot 1.08^3$ when deducted at the end of the second year, and so on; deductions made at the end of the fifth year will be joined to the sum accumulated without any increment. As a result, the total amount of renovation deductions for the five years will be approximately 1.000, that is, will ensure full up-dating of the facility.

Given any positive value E_{cn}, using the usual method of calculating renovation will lead to an inflated sum of up-dating accumulations, which is what happens in practice. Thus, given a service life of five years, instead of 0.170, they will deduct 0.200 annually for renovation, exceeding the needed deductions amount by 18 percent.

The Instructions for Determining the Economic Effectiveness of Capital Investments in Rail Transport point out that in the place of renovation deductions we can introduce directly into the calculation capital investments in those periods when the facility is being up-dated, with consideration of appropriate time factors η_t determined by complex percentaging. Given a service life of five years and $E_{cn}=0.08$, $\eta_t=0.681$, and the capital investments themselves (K) are 0.681 K, with consideration of the adjustment factors. Deducting 0.170 K annually for renovation, by the end of the service-life period, we obtain the same value (0.681 K), with consideration of the annual adjustment factors under the instructions.

It follows from this that calculations need to be determined using the formula given above when determining the economic effectiveness of capital investments, especially when renovation deductions differ sharply by variant. This has been noted in particular in the above-mentioned instruction in instances where facility variants with different service-life periods are being compared and optimum service-life periods are being selected. In planning and economic practice, the procedure for determining renovation deductions might not change when examining questions of recording, analyzing and making reciprocal financial calculations. Unfortunately, instructions for other types of transport do not indicate the use of this formula.

At the same time, it is evident from the table that in calculations of economic effectiveness, given renovation deductions overstatement by an average of 0.03-0.04, the normative effectiveness coefficient E_n is essentially increased by that same amount, that is, we introduce 0.13-0.14 into the calculation instead of 0.10, or we actually use 0.15-0.16 instead of 0.12. Therefore, as the 1969 Standard Methods point out, the normative for adjusting expenditures over time E_{cn} is 0.04 lower than the usual value E_n and is set at 0.08. However, when the formula of annual adjusted expenditures is used, renovation deductions are also usually defined as the ratio of the depreciated portion of the value of the facility to its service life, but E_n does not decrease in this regard. At the same time, the renovation deductions norm used when calculating operating expenses has a very substantial influence on our evaluation of effectiveness in terms of annual adjusted expenditures. In a number of instances, the lack of agreement between values φ, E_n and E_{cn} in all the branch instructions can lead to substantial errors in practical calculations.

Thus, the calculated capacity and indicators of railroad installations (as for example line route, route plan and profile, distribution and length of classification yards) cannot be changed without essentially wrecking them and are practically permanent. It is for that very reason that these parameters must be set as a function of value $E_n=E_{cn}$ and of the law of change in current expenditures (linear parabolic and others) in accordance with which the value of the calculation year is determined.

For linear growth in these expenditures, the calculation year must, regardless of the absolute amounts of the annual increment, be adopted as approximately the reciprocal of the adjusted expenditures norm, and it is precisely when E_{cn}=0.08 that the calculations must be made in terms of the 13th year. At the same time, the calculation year remains the 10th in all the official documents for planning new railroads, which corresponds to $E_n=E_{cn}$=0.10.

Thus, given accepted values E_n=0.10-0.12 and E_{cn}=0.08, we are in practice forced to use theoretical and norming calculation-year values which do not agree, in order to reduce the capital investments required as determined by the conditions of the calculation year.

It is to the point to recall that only if $E_n=E_{cn}$ and if value φ is calculated correctly will total annual adjusted expenditures over service life equal the initial value of the assets (Φ) with consideration of the time factor. In this regard, expenditures on creating assets can be taken into account in two ways: either directly, using the full value of their initial value at the moment they were created, or in the form of annual national economic outlays associated with these assets. These outlays are determined by wear on the assets and by national economic losses in another place due to limited accumulation funds. Naturally, both methods of recording the expenditures on creating assets must be identical and it is under precisely these conditions that there is full transfer (unit transfer, for instance) of the cost of assets to transport output. For example, given $E_n=E_{cn}$=0.08 and t_{sl} = 5 years, we have (0.08+0.17) x (0.926+0.857+0.794+0.735+0.681)=1.0. Given E_{cn}=0.08, total annual adjusted expenditures for the service-life period with consideration of the time factor equal 1.16, that is, 16 percent higher than the value of the assets. In railroad planning, the method of recording assets in annual adjusted expenditures is widely used to determine capital investments for rolling stock which is increasing in amount. Thus, the equivalence $E_n=E_{cn}$ is substantiated by a number of important practical and theoretical considerations.

It should be noted that, during the time the first method of determining the economic effectiveness of capital investments was in effect, when $E_{cn}=E_n$ was accepted, no fundamental errors, methods difficulties or nonconformities whatsoever arose. Therefore, when transport-wide methods are worked out, the prerequisites will be at hand for returning to the question of the relationship of these values.

In addition to the enumerated questions, there are a number of other provisions which must, in our view, be refined in the branch instructions for determining the effectiveness of capital investments.

We must first of all present in greater detail the problems of determining overall effectiveness and delimit precisely the sphere of application of indicators of overall and comparative effectiveness, as well as solve the problem of recording limited labor resources.

It is known that workers freed for other work at a given enterprise are switched over to other sectors of social construction and create additional national income. Calculations done at the Moscow Institute of Rail Transport Engineers show that the magnitude of the additional national income accounted for by one worker thus freed and not taken into account in the usual calculations is 60-70 percent of his wages. The specific additional income value cannot be accepted as being equal to its average value as accounted for by one worker employed in material production. Some of the workers freed go to new places of employment where fixed assets are already available. In this regard, the shift index increases and existing vacancies are filled, which facilitates using these assets better.

Recording the additional national economic impact strongly affects the results of optimization calculations. In several branches of the economy with a low level of profitability, wage expenditures increased by 70 percent can significantly exceed the value of their net output. Therefore, it is initially sufficient to limit oneself to adding to the wage only the value of the social consumption funds, estimated to be approximately 35 percent of the wage. It should be noted that this method of recording limited labor resources has already been recognized in the branch methods instructions on evaluating the effectiveness of new equipment (in rail transport in particular). In our opinion, it should also be disseminated to all other calculations of economic effectiveness.

Questions of recording the dynamics of price formation in construction and machine building, as well as the dynamics of operating expenses normatives, are important. It should be noted that it is a new and very complicated task common to all types of transport and one which has heretofore not received the proper attention to record the dynamics of price-formation in the long term when determining capital investment effectiveness.

It is known that the construction cost of facilities leaps upward with each review of the estimate norms and, correspondingly, with each re-evaluation of assets. When the 1969 estimate norms were introduced for recording changes in work cost left over as of January 1969, an adjustment factor of 1.20 was introduced prior to its recalculation for new railroad construction norms; the factor was 1.26 with consideration of wage increases. Along with the estimate normatives, norms for planning line shape and plans, the capacity of track superstructure and artificial installations and the norms for providing operations personnel with housing and cultural, personal-services and sanitation facilities are also reviewed periodically. In the end, all this leads to an increase in construction cost, although it is also accompanied by a reduction in several items of operating expenses. Moreover, capital investments in transport construction increase in response to environmental protection demands and difficulties in diverting land for the facilities being built.

When installation of these facilities is postponed, their cost increases, as a consequence of growth in calculated freight turnover, whose influence is also quite significant. As a result, for example, the cost of electrifying d.c. railroads in 1971-1975 had increased by an average of 45-50 percent as compared with 1958-1962 due to changes in planning and construction conditions; the increase for a.c. railroads was 25-30 percent. The cost of locomotives increased significantly slower during that same period: VL8 electric locomotives increased approximately three percent in cost, VL60's -- 21 percent. Growth in operating expenses normatives was also slight.

Currency effectiveness calculations, which have their own features for the different types of transport, have not yet been reflected in the branch instructions (except for maritime transport).

When determining the effectivess of capital investments, it is important to broaden the circle of factors being taken into account. It is foremost necessary, when evaluating the effectiveness of capital investments in transport, to introduce a factor for the incompleteness and indefiniteness of the available information. It should be noted that instructions on recording the indefiniteness and completeness of initial information are available only in the instruction for river transport. The mathematical aspect of this work is sufficiently clear. It is more complicated to determine the possible scope and probability of deviations from the initial data adopted in a plan for different conditions (shipment amounts, including those associated with foreign-trade operations; construction cost, including by stage of strengthening and developing the network sectors being studied; rolling stock value; operating expenses normatives).

Also in need of refinement is the evaluation of amounts of circulating capital diverted during the shipping process. For example, the formulas recommended for determining the amounts of circulating capital being diverted during seasonal interruptions in the operation of motor and river transport differ and yield significant discrepancies.

Evaluating passenger time in transit and the method of recording it in calculations of capital investment effectiveness require a coordinated resolution for all types of transport.

All the instructions lack recommendations on methods of determining losses when transport fails to meet shipment plans or when freight shipped is lost or its quality suffers. Only the instruction for motor transport gives detailed recommendations on recording national economic losses from road-transport accidents and instructions on determining the value of land diverted for construction needs, but they relate only to agricultural land and do not concern the temporary withdrawal of land from circulation. Moreover, there are no recommendations on evaluating the effectiveness of environmental protection measures, although several examples of calculations associated with resolving this task could have been developed.

Unfortunately, the level of existing research on determining the reduction in losses to agriculture from improvements in roads and in reducing shipment distances, the social impact of regular, reliable transport, and its influence on accelerating the rates of national economic development, do not yet permit making precise methods recommendations normatively differentiated for different conditions.

Thus, the branch instructions for the various types of transport are not fully coordinated with each other and do not take into account a number of important features of transport as a branch of material production; a number of provisions of the branch instructions hinder choosing the most effective paths of development and methods of utilizing capital investments for the different types of transport. Further improvement in the branch instructions must therefore be done on the basis of provisions common to the country's transport system as a whole.

In this connection, we especially need to develop transport-wide methods of evaluating the effectiveness of capital investments. But this does not mean that they would replace the branch instructions. The specifics of each type of transport must naturally be reflected in the branch instructions, but they must be drawn up in conformity with transport-wide methods.

We have now created a special commission which is engaged in working out draft transport-wide methods. The draft is based on the following principles of evaluating the effectiveness of capital investments in transport:

systems-nature -- The property of wholeness is objectively inherent to transport, as a complex system, so the impact of conducting an aggregate of measures can differ from the sum of the effects relating to individual measures. Therefore, in a number of instances evaluating the effectiveness of capital investments in developing the transport system cannot be reduced to isolated calculations for the individual elements comprising it, even in the condition of comparability of indicators of effectiveness for the different types of transport and methods of shaping the normative base is met (a necessary condition in systems analysis, of course);

comprehensiveness -- When examining the effectiveness of various measures, we must pay attention to the overall consequences of their implementation both directly in transport and outside it (including not only those of a technological or economic nature, but also those of a social or ecological nature and others);

balance -- Measures whose effectiveness is being evaluated must be feasible, that is, coordinated with the amounts of resources available for these purposes; in this regard, the impact in each specific instance must be not less than in other links of the national economy in which these resources might be used additionally;

optionality -- Highly effective use of capital investments in transport can be achieved only on the condition that all possible alternative resolutions of the task being set have been examined sufficiently fully;

optimality -- When evaluating the effectiveness of different directions of capital investment in transport, we should in a majority of instances procede from the criterion of carrying out all socially necessary freight and passenger shipments promptly and well, with minimal total national economic expenditures;

dynamicity -- When evaluating the effectiveness of developing transport, we must take into account the consequences of the time factor: presence of lag, change in demand for shipments, conditions and operating procedures at transport facilities, economic nonequivalence of expenditures made at different times, and so on;

stages-nature -- The development of transport (and especially of its infrastructure) has a discrete character due to the impossibility or inappropriateness of continuously increasing the capacity of transport facilities: each stage must ensure functioning for a certain (often long) period and so in evaluating effectiveness we must take into account the creation of economically justified throughput and load-capacity reserves;

adaptation -- It is objectively impossible to know precisely all the up-coming changes, so evaluating effectiveness will in a number of instances require the use of calculation methods with incomplete information (including probability theory, random processes, and others); in this regard, we must take into account the losses connected with future rational adaptation of the transport system and its facilities to previously unknown conditions and operating procedures;

hierarchality -- Transport is a complicated, multilevel complex of material production, individual large components of which (roads, steamship lines, and so on) possess a certain technological and economic independence, and so effectiveness must be evaluated with consideration of the cost-accounting mechanism and local interests, which sometimes make substantial adjustments in the amount of expenditures connected with adaptation, and other economic characteristics;

controllability -- As useful new information is received, previous decisions on and evaluations of their effectiveness can and must be refined and it will only be possible to influence up-coming expenditures and effects whose magnitude will depend on the decisions made.

The development of transport-wide methods of determining capital investment effectiveness will enable us to use more intelligently the funds being directed into developing all types of transport, to ensure the more precise operation of the ASPRT [automated system of plan calculations for transport] systems being created in the USSR Gosplan and automated control systems for all types of transport, and to make it easier to resolve tasks associated with the joint review of measures and with optimizing the distribution of capital investments among them.

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